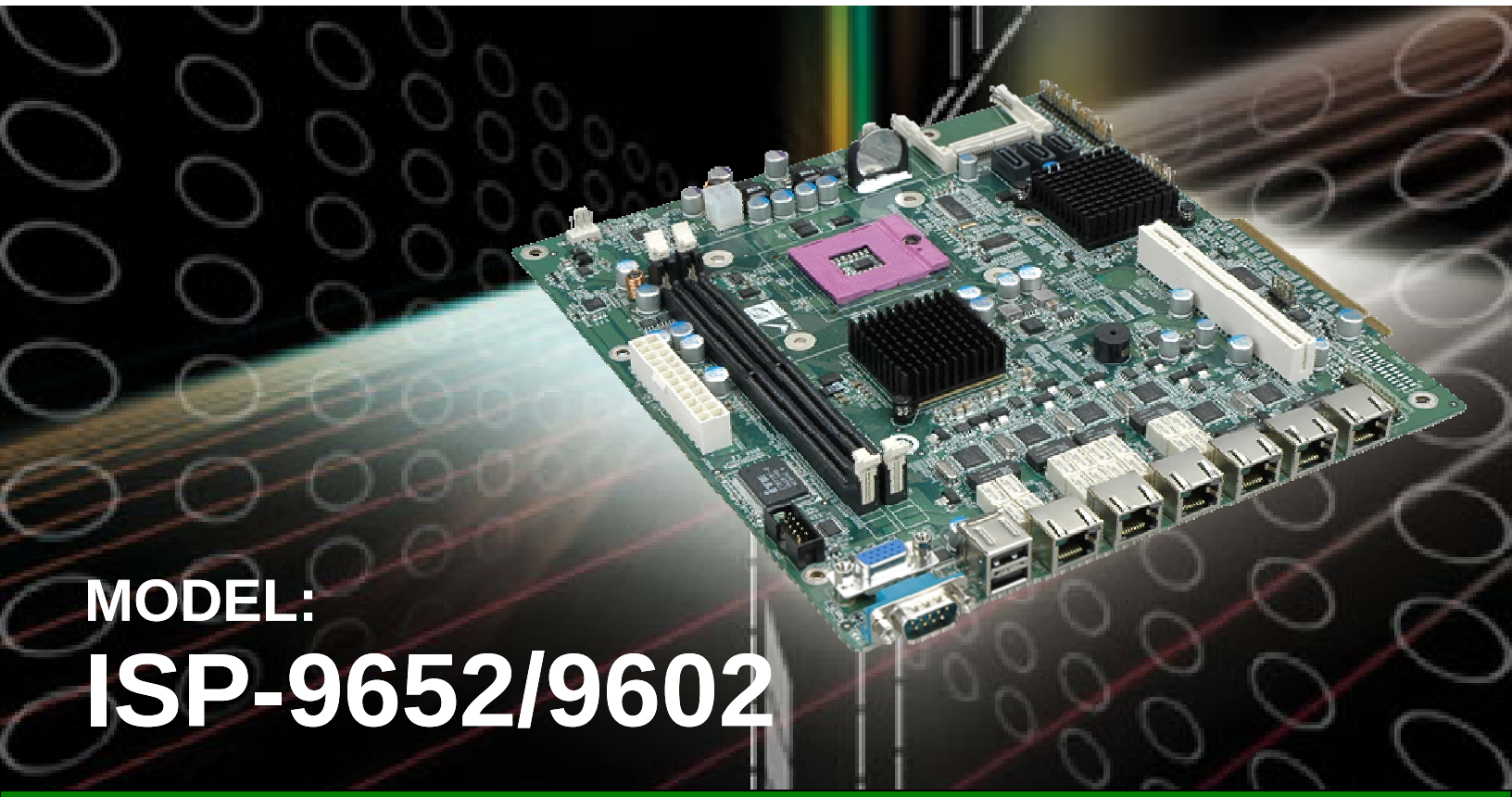
IEI Technology Corp.



MODEL:

ISP-9652/9602

MicroATX Socket P Motherboard for Intel® Core™2 Duo / Celeron® M CPU, VGA, Four PCIe GbE LAN with dual-group bypass function, Two PCIe GbE LAN, SATA 3.0 Gb/s, USB 2.0 and CompactFlash®, RoHS Compliant

User Manual

Rev. 1.00 – 12 February, 2010

RoHS Lead Free

Revision

Date	Version	Changes
12 February, 2010	1.00	Initial release

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Chapter

1

Introduction

1.1 Introduction

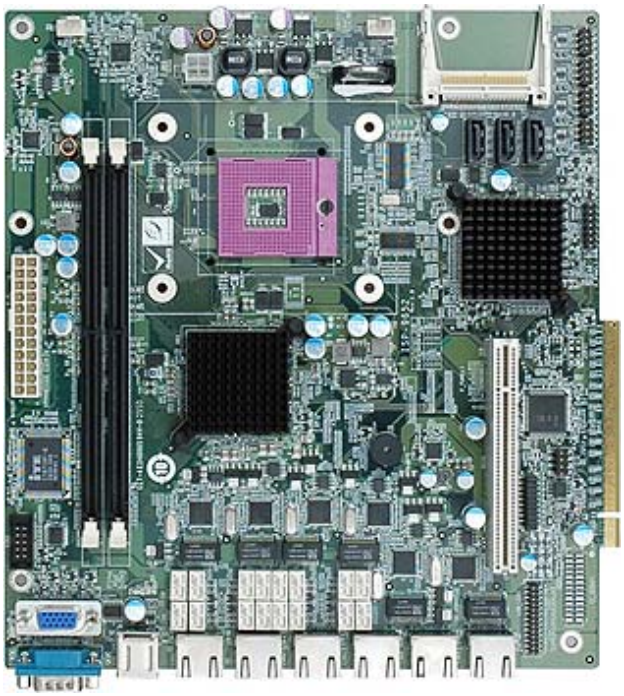


Figure 1-1: ISP-9652/9602

The ISP-9652/9602 MicroATX motherboard is a Socket P Intel® Core™2 Duo and Intel® Celeron® M processor platform. 45nm core and 65nm core processors are supported.

Up to two 2.0 GB 667/533 MHz are supported by the Intel® GME965 graphics memory controller hub (GMCH) on the ISP-9652, while the Intel® GML960 on the ISP-9602 supports two 1.0 GB 533 MHz DDR2 SDRAM DIMMs. Both included an onboard VGA output.

The integrated Intel® ICH8M I/O controller hub (ICH) supports three SATA 3Gb/s drives with data transfer speeds of 3.0 Gbps. Ten USB 2.0 channels and one expansion PCI socket provide flexible expansion options. The ISP-9652 also provides PCIe x16 expansion through an edge connector.

The ISP-9652/9602 features four GbE LAN connections with two dual-group LAN bypass function. In the event of a failure the hardware LAN bypass will be activated to ensure essential network communications will continue. Two additional GbE LAN ports without LAN bypass are included.

1.2 Connectors

The connectors on the ISP-9652/9602 are shown in the figure below.

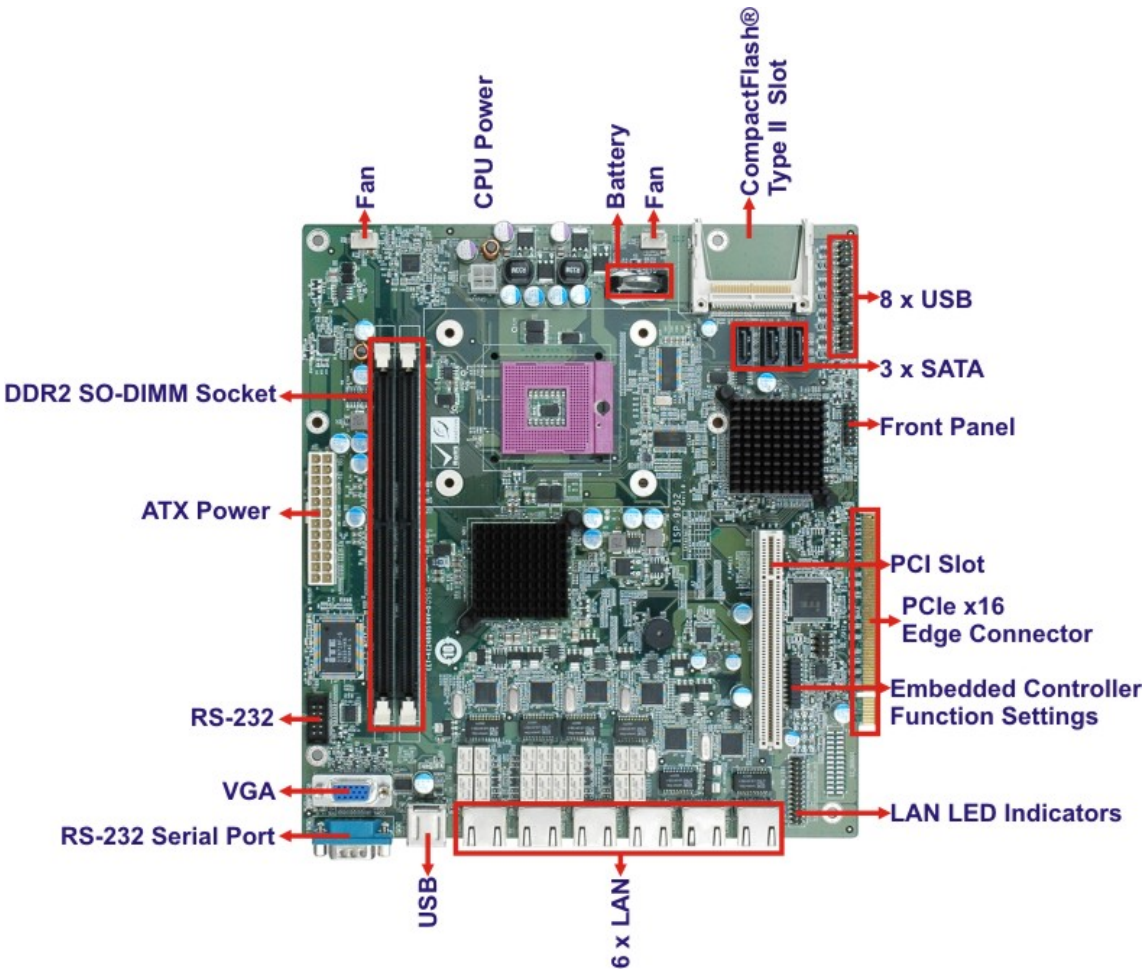


Figure 1-2: Connectors

1.3 Dimensions

The dimensions of the board are listed below:

- **Length**: 220 mm
- **Width**: 244 mm

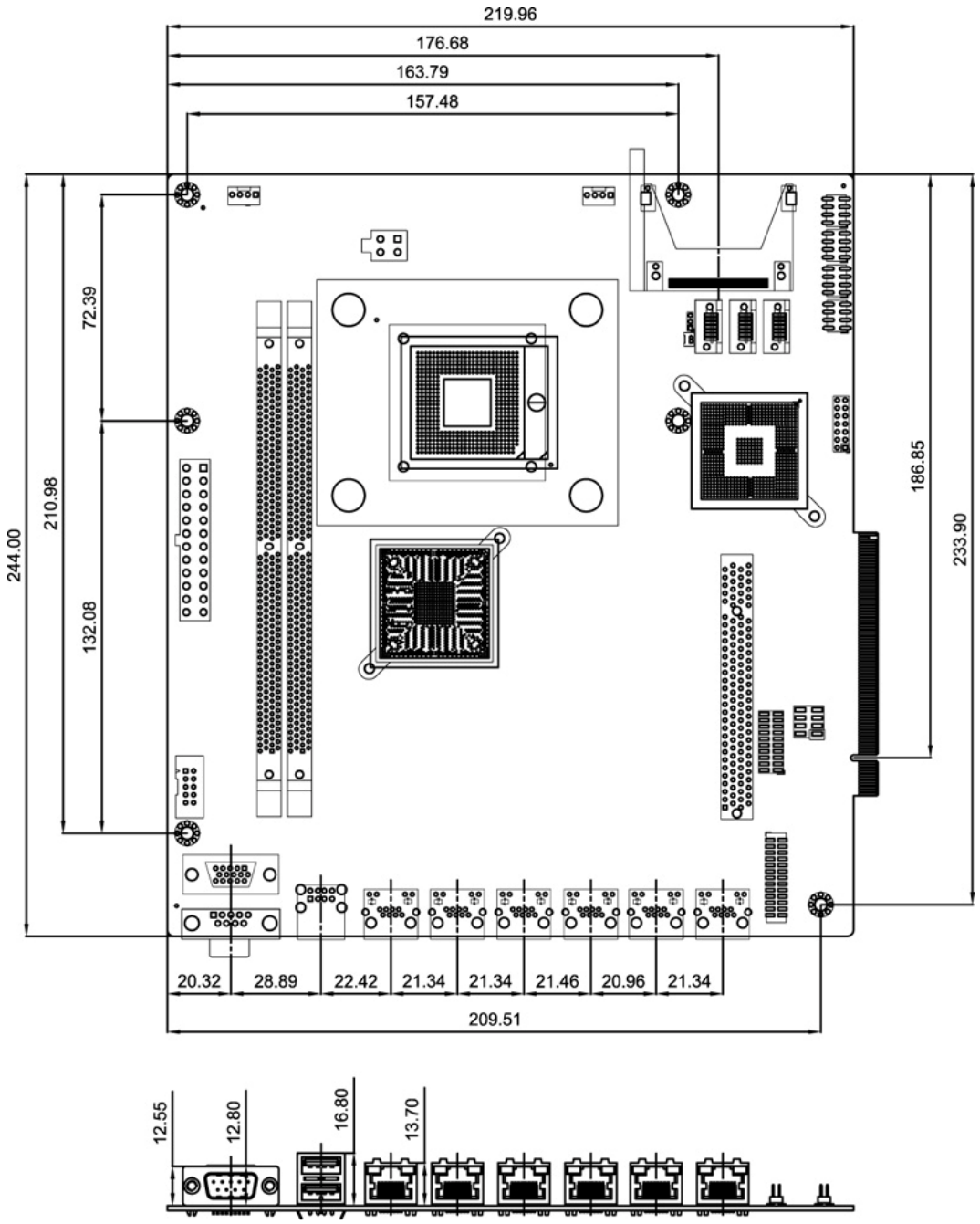


Figure 1-3: ISP-9652/9602 Dimensions (mm)

1.4 Data Flow

Figure 1-4 shows the data flow between the two on-board chipsets and other components installed on the motherboard and described in the following sections of this chapter.

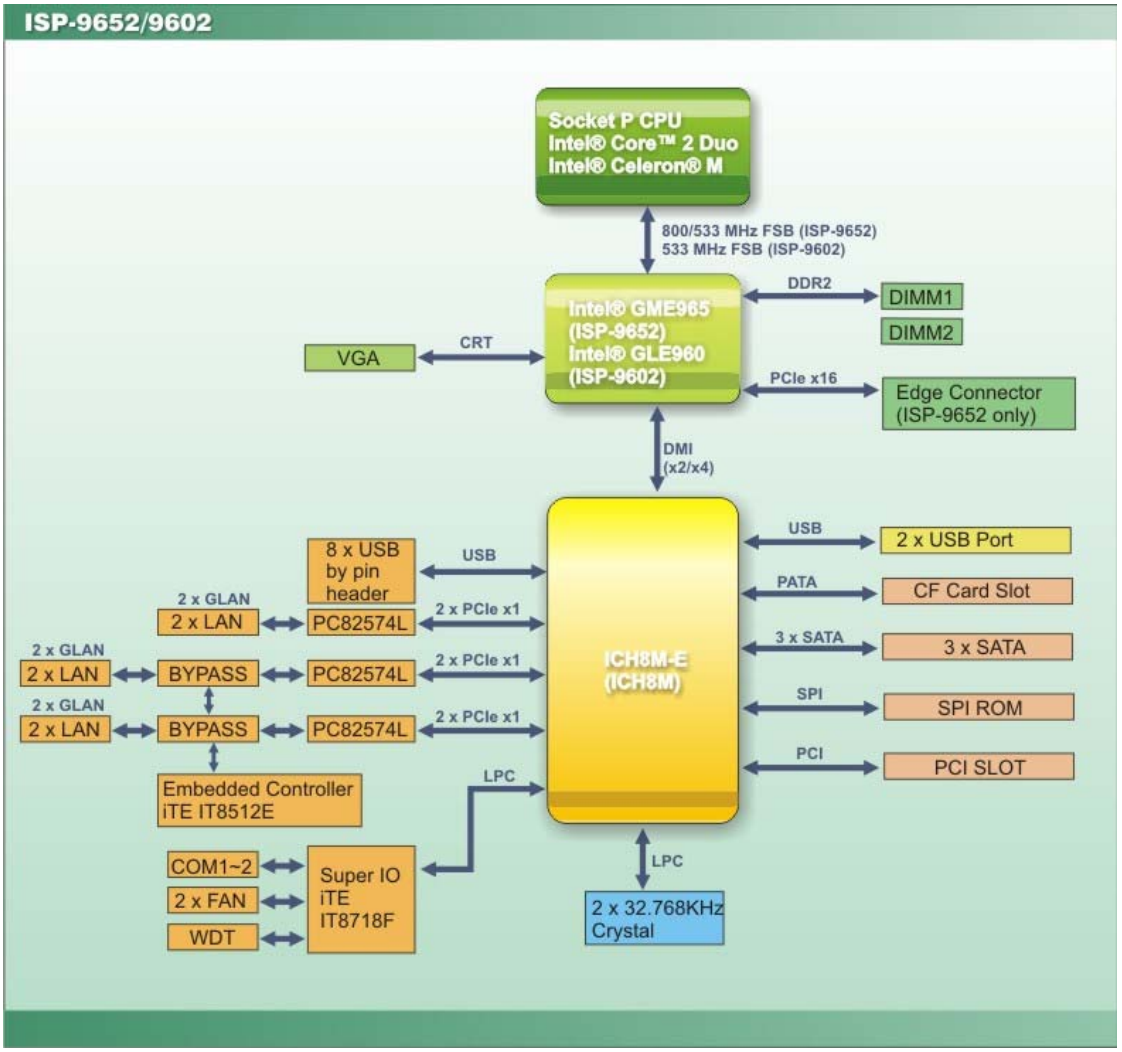


Figure 1-4: Data Flow Block Diagram

1.5 Technical Specifications

ISP-9652/9602 technical specifications are listed in table below.

Specification	ISP-9652/9602	ISP-9602
Form Factor	MicroATX	
Socket	Socket P	
CPU Supported	Socket P Intel® Core™2 Duo processor Socket P Intel® Celeron® M processor	
Front Side Bus (FSB)	800/533 MHz	533 MHz
Northbridge Chipset	Intel® GME965	Intel® GLE960
Southbridge Chipset	Intel® ICH8M	
Memory	Two 240-pin DIMM sockets support two 667/533 MHz DDR2 SDRAM DIMM (system max. 4 GB)	Two 240-pin DIMM sockets support two 533 MHz DDR2 SDRAM DIMM (system max. 2 GB)
Super I/O	iTE IT8718F	
Embedded Controller	iTE IT8512E	
LAN	Six Intel® PCIe GbE 82574L controllers	
BIOS	AMI BIOS	
Watchdog Timer	Software programmable supports 1~255 sec. system reset	
Expansion		
PCI	One PCI slot	
PCIe	One PCIe x16 via edge connector (ISP-9652 only)	
I/O Interface Connectors		

Specification	ISP-9652/9602	ISP-9602
Display	One VGA port	
Ethernet	Six RJ-45 GbE ports	
Serial Ports	One RS-232 Serial Port One RS-232 via internal box header	
USB 2.0/1.1 ports	Two USB ports Eight USB via internal pin headers	
Storage		
CompactFlash®	One CompactFlash® Type II slot	
Serial ATA	Three independent Serial ATA (SATA) channels with 3.0 Gb/s data transfer rates	
Environmental and Power Specifications		
Power Supply	ATX power	
Power Consumption	5V @ 12.9 A, 12V @ 0.14A, 12V_Core @ 12.69A, 3.3V @ 0.47A (Intel® Core™2 Duo T7500 2.2GHz with two DDR2 800MHz 2GB DRAM)	
Operating temperature	0ºC ~ 60ºC (requires cooler and silicone heat sink paste)	
Storage temperature	-40ºC ~ 85ºC	
Humidity	0% ~ 95% (non-condensing)	
Physical Specifications		
Dimensions	244 mm x 220 mm	
Weight GW/NW	1000 g/450 g	

Table 1-1: Technical Specifications

Chapter

2

Unpacking

2.1 Anti-static Precautions

WARNING!

Static electricity can destroy certain electronics. Make sure to follow the ESD precautions to prevent damage to the product, and injury to the user.

Make sure to adhere to the following guidelines:

- ***Wear an anti-static wristband***: Wearing an anti-static wristband can prevent electrostatic discharge.
- ***Self-grounding***: Touch a grounded conductor every few minutes to discharge any excess static buildup.
- ***Use an anti-static pad***: When configuring any circuit board, place it on an anti-static mat.
- ***Only handle the edges of the PCB***: Don't touch the surface of the motherboard. Hold the motherboard by the edges when handling.

2.2 Unpacking Precautions

When the ISP-9652/9602 is unpacked, please do the following:

- Follow the antistatic guidelines above.
- Make sure the packing box is facing upwards when opening.
- Make sure all the packing list items are present.

2.3 Packing List

NOTE:

If any of the components listed in the checklist below are missing, do not proceed with the installation. Contact the IEI reseller or vendor the ISP-9652/9602 was purchased from or contact an IEI sales representative directly by sending an email to sales@iei.com.tw.

The ISP-9652/9602 is shipped with the following components:

Quantity	Item and Part Number	Image
1	ISP-9652/9602 motherboard	
3	SATA cable (**P/N**: 32000-062800-RS)	
1	Mini jumper pack (2.0mm) (**P/N**: 33100-000033-RS)	
1	Utility CD	
1	Quick Installation Guide	

2.3.1 Optional Items

The ISP-9652/9602 is shipped with the following components:

Item and Part Number	Image
CPU cooler (**P/N**: CF-479B-RS)	
SATA power cable (**P/N**: 32102-000100-100-RS) (**P/N**: 32102-000100-200-RS) (**P/N**: 32102-000100-300-RS)	

Single port RS-232 cable (**P/N**: 19800-000114-RS)	
Quad port USB cable (**P/N**: CB-USB14-RS)	

Chapter

3

Connectors

3.1 Peripheral Interface Connectors

This chapter details all the jumpers and connectors.

3.1.1 ISP-9652/9602 Layout

The figures below show all the connectors and jumpers.

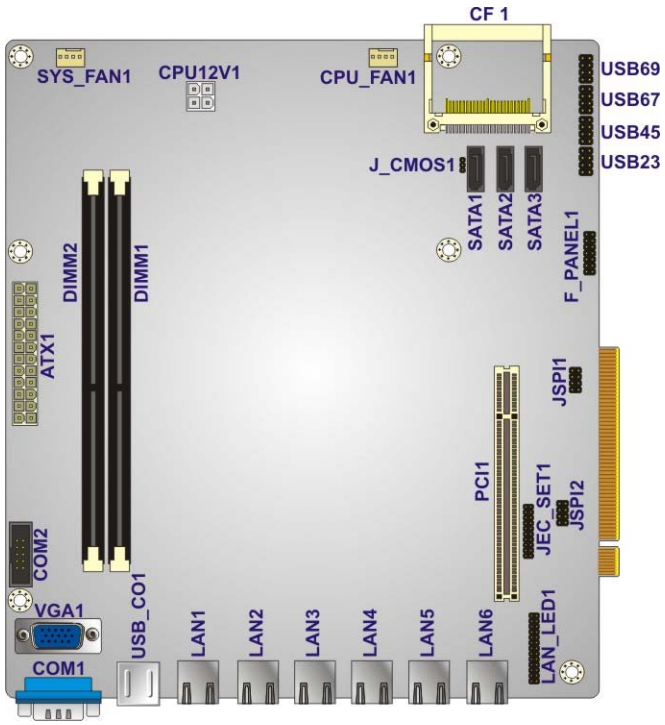


Figure 3-1: Connector and Jumper Locations

3.1.2 Peripheral Interface Connectors

The table below lists all the connectors on the board.

Connector	Type	Label
12 V CPU power connector	4-pin Molex	CPU12V1
ATX power source connector	20-pin ATX	ATX1
DDR2 DIMM socket	240-pin socket	DIMM1, DIMM2
CompactFlash® slot	50-pin header	CF1
Fan connector (CPU)	4-pin wafer	CPU_FAN1

Connector	Type	Label
Fan connector (system)	4-pin wafer	SYS_FAN1
Front panel connector	14-pin header	F_PANEL1
LAN LED connector	26-pin header	LAN_LED1
Serial ATA (SATA) drive connectors	7-pin SATA	SATA1, SATA2, SATA3
RS-232 serial port connector	10-pin header	COM2
USB connectors	8-pin header	USB23, USB45, USB67, USB68

Table 3-1: Peripheral Interface Connectors

3.1.3 External Interface Panel Connectors

The table below lists the connectors on the external I/O panel.

Connector	Type	Label
Ethernet connector	RJ-45	LAN1, LAN2 LAN3, LAN4 LAN5, LAN6
USB ports (dual)	USB port	USB_CO1
VGA port connector	15-pin female	VGA1

Table 3-2: Rear Panel Connectors

3.2 Internal Peripheral Connectors

The section describes all of the connectors on the ISP-9652/9602.

3.2.1 12V Power Connector

CN Label: **CPU12V1**

CN Type: 4-pin Molex connector (2x2)

CN Location: See **Figure 3-2**

CN Pinouts: See **Table 3-3**

The connector supports the 12V power supply.

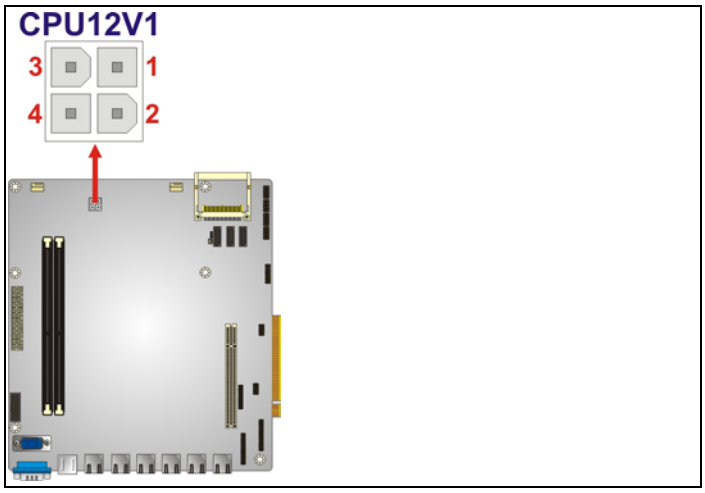


Figure 3-2: CPU 12V Power Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	GND
3	+12V	4	+12V

Table 3-3: CPU 12V Power Connector Pinouts

3.2.2 ATX Power Connector

CN Label: **ATX1**

CN Type: 20-pin ATX (2x10)

CN Location: See **Figure 3-3**

CN Pinouts: See **Table 3-4**

The ATX power connector connects to an ATX power supply.

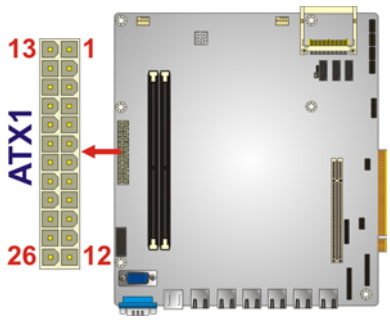


Figure 3-3: ATX Power Connector Pinout Locations

Pin	Description	Pin	Description
1	+3.3 V	11	+3.3 V
2	+3.3 V	12	-12 V
3	GND	13	GND
4	+5 V	14	PS-ON
5	GND	15	GND
6	+5 V	16	GND
7	GND	17	GND
8	PW-OK	18	-5 V
9	+VCC5SB	19	+5 V
10	FP22	20	+5 V

Table 3-4: ATX Power Connector Pinouts

3.2.3 CompactFlash® Slot

CN Label: **CF1**

CN Type: CompactFlash® card slot

CN Location: See **Figure 3-4**

CN Pinouts: See **Table 3-5**

A CompactFlash® Type I/II card can be used in this slot.

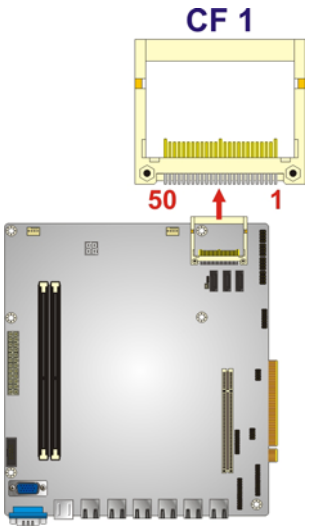


Figure 3-4: CompactFlash® Slot Location

Pin	Description	Pin	Description
1	GROUND	26	VCC-IN CHECK1
2	DATA 3	27	DATA 11
3	DATA 4	28	DATA 12
4	DATA 5	29	DATA 13
5	DATA 6	30	DATA 14
6	DATA 7	31	DATA 15
7	HDC_CS0#	32	HDC_CS1
8	N/C	33	N/C
9	GROUND	34	IOR#
10	N/C	35	IOW#
11	N/C	36	VCC_COM
12	N/C	37	IRQ15
13	VCC_COM	38	VCC_COM
14	N/C	39	CSEL
15	N/C	40	N/C
16	N/C	41	HDD_RESET
17	N/C	42	IORDY
18	SA2	43	SDREQ
19	SA1	44	SDACK#

Pin	Description	Pin	Description
20	SA0	45	HDD_ACTIVE#
21	DATA 0	46	66DET
22	DATA 1	47	DATA 8
23	DATA 2	48	DATA 9
24	N/C	49	DATA 10
25	VCC-IN CHECK2	50	GROUND

Table 3-5: CompactFlash® Slot Pinouts

3.2.4 Fan Connectors

CN Label: **CPU_FAN1 and SYS_FAN1**

CN Type: 4-pin wafer (1x4)

CN Location: See **Figure 3-5**

CN Pinouts: See **Table 3-6**

The cooling fan connector provides a 12V, 500mA current to the cooling fan. The connector has a "rotation" pin to get rotation signals from fans and notify the system so the system BIOS can recognize the fan speed. Please note that only specified fans can issue the rotation signals.

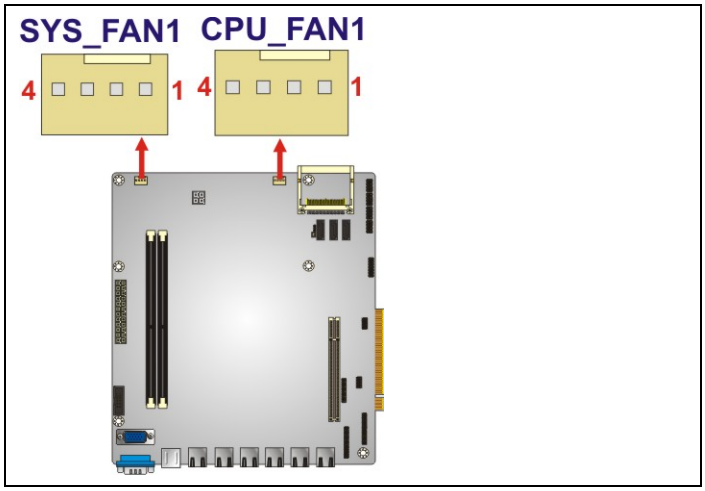


Figure 3-5: +12V Fan Connector Locations

PIN NO.	DESCRIPTION
1	GND
2	+12V
3	DETECT
4	CONTROL

Table 3-6: +12V Fan Connector Pinouts

3.2.5 Front Panel Connector

CN Label: **F_PANEL1**

CN Type: 14-pin header (2x7)

CN Location: See **Figure 3-6**

CN Pinouts: See **Table 3-7**

The front panel connector connects to external switches and indicators to monitor and controls the motherboard. These indicators and switches include:

- Power button
- Reset
- Power LED
- HDD LED

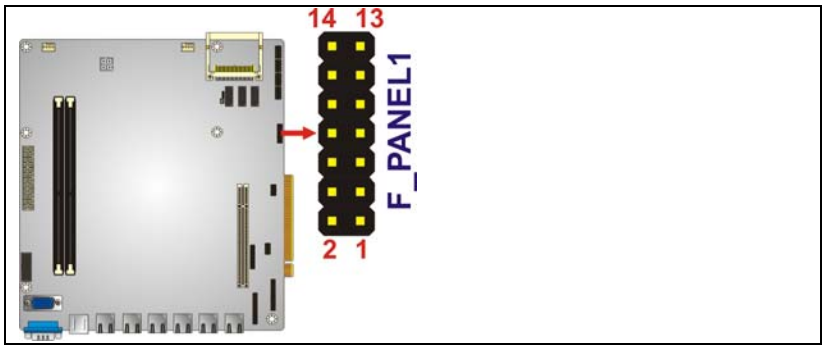


Figure 3-6: Front Panel Connector Location

FUNCTION	PIN	DESCRIPTION	FUNCTION	PIN	DESCRIPTION
Power LED	1	+5V	Speaker	2	+5V
	3	N/C		4	N/C
	5	GND		6	N/C
Power Button	7	PWRBT-		8	Speaker
	9	GND	Reset	10	N/C
HDD LED	11	IDELED		12	Reset-
	13	HDLED-		14	GND

Table 3-7: Front Panel Connector Pinouts

3.2.6 LAN LED Connector

CN Label: **LAN_LED1**

CN Type: 26-pin header (2x13)

CN Location: See **Figure 3-7**

CN Pinouts: See **Table 3-8**

The LAN LED connector connects to LAN activity LED and linked LED on the system front panel.

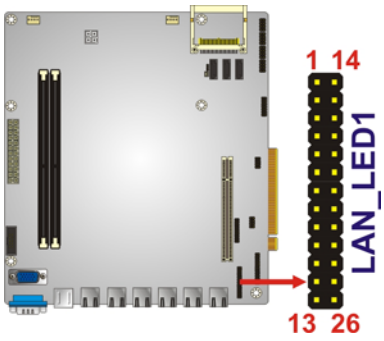


Figure 3-7: LAN LED Connector Location

Pin	Description	Pin	Description
1	CN_L1_LINK_ACT#	14	CN_L1_LED
2	CN_L1_100#	15	CN_L1_1000#
3	CN_L2_LINK_ACT#	16	CN_L2_LED
4	CN_L2_100#	17	CN_L2_1000#
5	CN_L3_LINK_ACT#	18	CN_L3_LED
6	CN_L3_100#	19	CN_L3_1000#
7	CN_L4_LINK_ACT#	20	CN_L4_LED
8	CN_L4_100#	21	CN_L4_1000#
9	CN_L5_LINK_ACT#	22	CN_L5_LED
10	CN_L5_100#	23	CN_L5_1000#
11	CN_L6_LINK_ACT#	24	CN_L6_LED
12	CN_L6_100#	25	CN_L6_1000#
13	N/C	26	N/C

Table 3-8: LAN LED Connector Pinouts

3.2.7 PCI Slot

CN Label: **PCI1**

CN Type: PCI Slot

CN Location: See **Figure 3-8**

CN Pinouts: See **Table 3-9**

The PCI slot enables a PCI expansion module to be connected to the board.

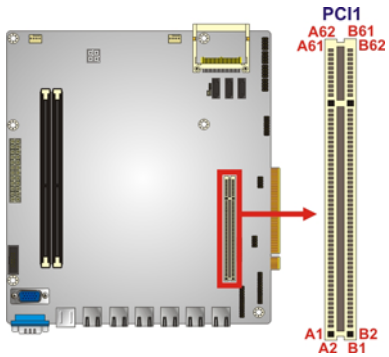


Figure 3-8: PCI Slot Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
A1	TRST	B1	-12 V
A2	+12 V	B2	TCK
A3	TMS	B3	GND
A4	TDI	B4	TDO
A5	+5 V	B5	+5 V
A6	INTA	B6	+5 V
A7	INTC	B7	INTB
A8	+5 V	B8	INTD
A9	RESERVED3	B9	PRSNT1
A10	+5 V	B10	RESERVED1
A11	RESERVED4	B11	PRSNT2
A12	GND	B12	GND
A13	GND	B13	GND
A14	3.3 V_AUX	B14	RESERVED2
A15	RST	B15	GND
A16	+5 V	B16	CLK
A17	GNT	B17	GND
A18	GND	B18	REQ
A19	PME	B19	+5 V
A20	AD30	B20	AD31
A21	+3.3 V	B21	AD29
A22	AD28	B22	GND
A23	AD26	B23	AD27
A24	GND	B24	AD25
A25	AD24	B25	+3.3 V
A26	IDSEL	B26	C/BE3
A27	+3.3 V	B27	AD23
A28	AD22	B28	GND
A29	AD20	B29	AD21
A30	GND	B30	AD19
A31	AD18	B31	+3.3 V
A32	AD16	B32	AD17

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
A33	+3.3 V	B33	C/BE2
A34	FRAME	B34	GND
A35	GND	B35	IRDY
A36	TRDY	B36	+3.3 V
A37	GND	B37	DEVSEL
A38	STOP	B38	GND
A39	+3.3 V	B39	LOCK
A40	SDONE	B40	PERR
A41	SBO	B41	+3.3 V
A42	GND	B42	SERR
A43	PAR	B43	+3.3 V
A44	AD15	B44	C/BE1
A45	+3.3 V	B45	AD14
A46	AD13	B46	GND
A47	AD11	B47	AD12
A48	GND	B48	AD10
A49	AD9	B49	GND
A52	C/BE0	B52	AD8
A53	+3.3 V	B53	AD7
A54	AD6	B54	+3.3 V
A55	AD4	B55	AD5
A56	GND	B56	AD3
A57	AD2	B57	GND
A68	AD0	B68	AD1
A59	+5 V	B59	+5 V
A60	REQ64	B60	ACK64
A61	+5 V	B61	+5 V
A62	+5 V	B62	+5 V

Table 3-9: PCI Slot

3.2.8 SATA Drive Connectors

CN Label:	**SATA1, SATA2 and SATA3**
CN Type:	7-pin SATA 3Gb/s drive connectors
CN Location:	See **Figure 3-9**
CN Pinouts:	See **Table 3-10**

The three SATA 3Gb/s drive connectors are each connected to a SATA 3Gb/s drive. The drives transfer data at speeds as high as 3.0 Gb/s.

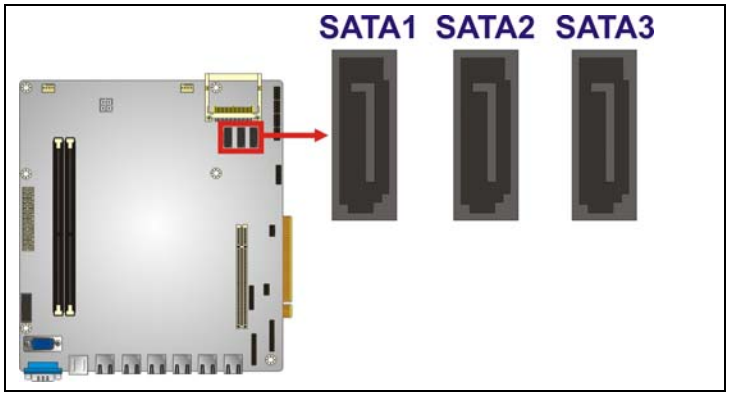


Figure 3-9: SATA Drive Connector Locations

PIN NO.	DESCRIPTION
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

Table 3-10: SATA Drive Connector Pinouts

3.2.9 Serial Port Connector

CN Label: **COM2**

CN Type: 10-pin header (2x5)

CN Location: See **Figure 3-10**

CN Pinouts: See **Table 3-11**

This connector provides RS-232 communications.

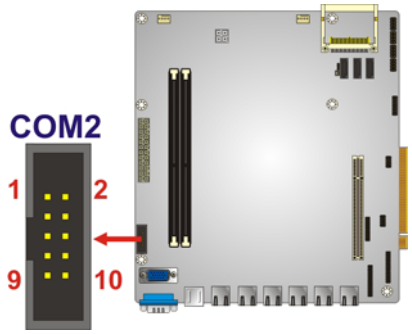


Figure 3-10: Serial Port Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Data Carrier Direct (DCD)	2	Data Set Ready (DSR)
3	Receive Data (RXD)	4	Request To Send (RTS)
5	Transmit Data (TXD)	6	Clear To Send (CTS)
7	Data Terminal Ready (DTR)	8	Ring Indicator (RI)
9	Ground (GND)	10	Ground (GND)

Table 3-11: Serial Port Connector Pinouts

3.2.10 EC SPI Flash Connector

CN Label: **JSPI1, JSP2**

CN Type: 8-pin header (2x4)

CN Location: See **Figure 3-11**

CN Pinouts: See **Table 3-12**

The 8-pin SPI Flash connectors are used to flash the BIOS.

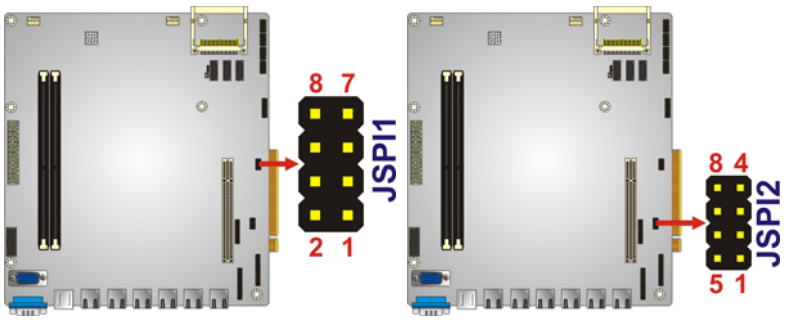


Figure 3-11: SPI Flash Connector Locations

PIN	DESCRIPTION	PIN	DESCRIPTION
1	VCC	2	CE#
3	SO	4	N/C
5	GND	6	CLOCK
7	SI	8	N/C

Table 3-12: SPI Flash Connector Pinouts

3.2.11 USB Connectors

CN Label: **USB23, USB45, USB67 and USB68**

CN Type: 8-pin header (2x4)

CN Location: See **Figure 3-12**

CN Pinouts: See Table **3-17**

The USB connectors connect to USB devices. Each pin header provides two USB ports.

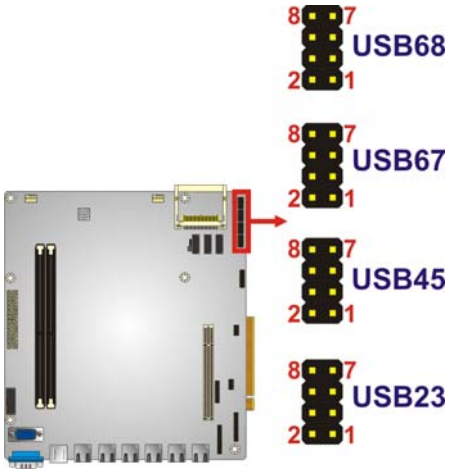


Figure 3-12: USB Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	GND
3	DATAN-	4	DATA1M-
5	DATAN+	6	DATAM+
7	GND	8	VCC

Table 3-13: USB Port Connector Pinouts

3.2.12 VGA Connector

CN Label: **VGA1**

CN Type: 15-pin Female

CN Location: See **Figure 3-13**

CN Pinouts: See **Table 3-14**

The ISP-9652/9602 has a single 15-pin female connector for connectivity to standard display devices.

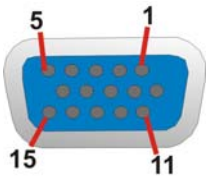


Figure 3-13: VGA Connector

PIN	DESCRIPTION	PIN	DESCRIPTION
1	RED	9	VGAVCC
2	GREEN	10	GROUND
3	BLUE	11	NC
4	NC	12	DDCDAT
5	GROUND	13	HSYNC
6	GROUND	14	VSYNC
7	GROUND	15	DDCCLK
8	GROUND		

Table 3-14: VGA Connector Pinouts

3.3 External Peripheral Interface Connector Panel

Figure 3-14 shows the ISP-9652/9602 external peripheral interface connector (EPIC) panel. The ISP-9652/9602 EPIC panel consists of the following:

- 6 x RJ-45 LAN connectors
- 2 x USB connectors
- 1 x RS-232 Serial port connector

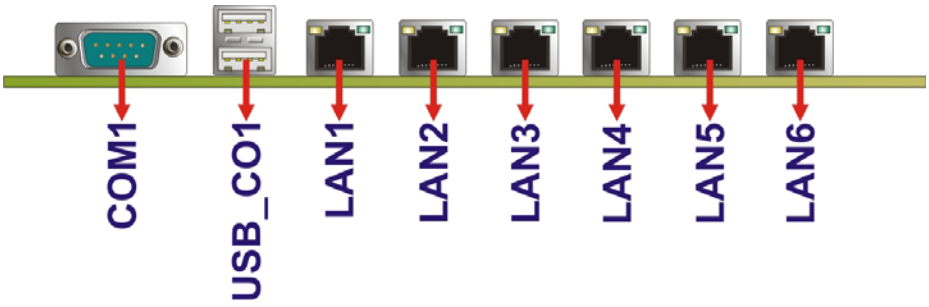


Figure 3-14: ISP-9652/9602 External Peripheral Interface Connector

3.3.1 LAN Connectors

CN Label: **LAN1~6**

CN Type: RJ-45

CN Location: See **Figure 3-15**

CN Pinouts: See **Table 3-15**

The ISP-9652/9602 is equipped with six built-in RJ-45 Ethernet controllers. The controllers connect to the LAN through six RJ-45 LAN connectors. There are two LEDs on the connector indicating the status of LAN. The pin assignments are listed in the following table:

PIN	DESCRIPTION	PIN	DESCRIPTION
1	MDIA0+	5	MDIA2-
2	MDIA0-	6	MDIA1-
3	MDIA1+	7	MDIA3+
4	MDIA2+	8	MDIA3-

Table 3-15: LAN Pinouts

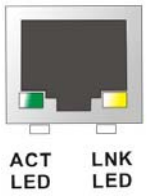


Figure 3-15: RJ-45 Ethernet Connector

The RJ-45 Ethernet connector has two status LEDs, one green and one yellow. The green LED indicates activity on the port and the yellow LED indicates the port is linked. See **Table 3-16**.

STATUS	DESCRIPTION	STATUS	DESCRIPTION
GREEN	Activity	YELLOW	Linked

Table 3-16: RJ-45 Ethernet Connector LEDs

3.3.2 USB Connectors

CN Label: **USB_CO1**

CN Type: USB port

CN Location: See **Figure 3-16**

CN Pinouts: See **Table 3-17**

The ISP-9652/9602 has two external USB 2.0 ports. The ports connect to both USB 2.0 and USB 1.1 devices.

PIN NO.	DESCRIPTION
1	VCC
2	DATA-
3	DATA+
4	GROUND

Table 3-17: USB Port Connector Pinouts

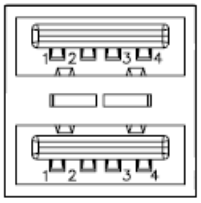


Figure 3-16: RJ-45 Ethernet Connector

Chapter

4

Installation

4.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the ISP-9652/9602 may result in permanent damage to the ISP-9652/9602 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the ISP-9652/9602. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the ISP-9652/9602 or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***: Before handling the board, touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring the ISP-9652/9602, place it on an antic-static pad. This reduces the possibility of ESD damaging the ISP-9652/9602.
- ***Only handle the edges of the PCB***: When handling the PCB, hold the PCB by the edges.

4.2 Installation Considerations

NOTE:

The following installation notices and installation considerations should be read and understood before the ISP-9652/9602 is installed. All installation notices pertaining to the ISP-9652/9602 should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the ISP-9652/9602 and injury to the person installing the motherboard.

4.2.1 Installation Notices

Warning:

The installation instructions described in this manual should be carefully followed in order to prevent damage to the ISP-9652/9602, its components and injury to the user.

Before and during the installation please **DO** the following:

- Read the user manual:
  - The user manual provides a complete description of the ISP-9652/9602 installation instructions and configuration options.
- Wear an electrostatic discharge cuff (ESD):
  - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- Place the ISP-9652/9602 on an antistatic pad:
  - When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.
- Turn all power to the ISP-9652/9602 off:
  - When working with the ISP-9652/9602, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the ISP-9652/9602 **DO NOT:**

- Remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- Use the product before verifying all the cables and power connectors are properly connected.
- Allow screws to come in contact with the PCB circuit, connector pins, or its components.

4.2.2 Installation Checklist

The following checklist is provided to ensure the ISP-9652/9602 is properly installed.

- All the items in the packing list are present
- A compatible memory module is properly inserted into the slot
- The CF Type I or CF Type II card is properly installed into the CF socket
- The jumpers have been properly configured
- The ISP-9652/9602 is inserted into a chassis with adequate ventilation
- The correct power supply is being used
- The following devices are properly connected
  - SATA drives
  - Power supply
  - USB cable
  - Serial port cable
- The following external peripheral devices are properly connected to the chassis:
  - VGA screen
  - RS-232 serial communications device
  - USB devices

4.3 Unpacking

When the ISP-9652/9602 is unpacked, please check all the unpacking list items listed in Chapter 3 are present. If any of the unpacking list items are not available please contact the ISP-9652/9602 reseller/vendor where the ISP-9652/9602 was purchased or contact an IEI sales representative.

4.4 CPU, CPU Cooling Kit and DIMM Installation

WARNING:

A CPU should never be turned on without the specified cooling kit being installed. If the cooling kit (heat sink and fan) is not properly installed and the system turned on, permanent damage to the CPU, ISP-9652/9602 and other electronic components attached to the system may be incurred. Running a CPU without a cooling kit may also result in injury to the user.

The CPU, CPU cooling kit and DIMM are the most critical components of the ISP-9652/9602. If one of these component is not installed the ISP-9652/9602 cannot run.

4.4.1 Socket P CPU Installation

WARNING:

CPUs are expensive and sensitive components. When installing the CPU please be careful not to damage it in anyway. Make sure the CPU is installed properly and ensure the correct cooling kit is properly installed.

To install a socket P CPU onto the ISP-9652/9602, follow the steps below:

WARNING:

When handling the CPU, only hold it on the sides. DO NOT touch the pins at the bottom of the CPU.

Step 1: **Unlock the CPU retention screw.** When shipped, the retention screw of the CPU socket should be in the unlocked position. If it is not in the unlocked position, use a screwdriver to unlock the screw. See **Figure 4-1**.

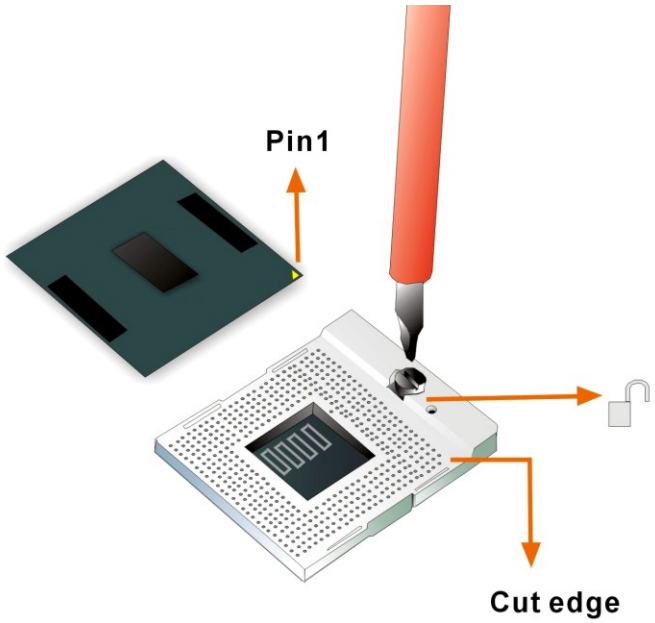


Figure 4-1: Make sure the CPU socket retention screw is unlocked

Step 2: **Inspect the CPU socket.** Make sure there are no bent pins and make sure the socket contacts are free of foreign material. If any debris is found, remove it with compressed air.

Step 3: Correctly Orientate the CPU. Make sure the IHS (integrated heat sink) side is facing upwards.

Step 4: Correctly position the CPU. Match the Pin 1 mark with the cut edge on the CPU socket. See **Figure 4-1**.

Step 5: Align the CPU pins. Carefully align the CPU pins with the holes in the CPU socket.

Step 6: Insert the CPU. Gently insert the CPU into the socket. If the CPU pins are properly aligned, the CPU should slide into the CPU socket smoothly.

Step 7: Lock the retention screw. Rotate the retention screw into the locked position. See **Figure 4-2**.

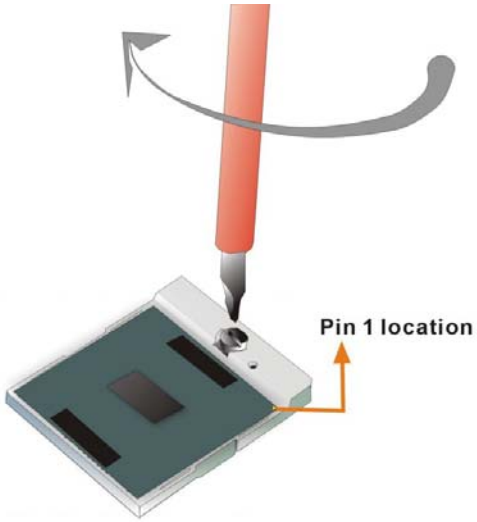


Figure 4-2: Lock the CPU Socket Retention Screw

4.4.2 Socket P Cooling Kit Installation

An IEI Socket P CPU cooling kit can be purchased separately. (See **Chapter 3**) The cooling kit comprises a CPU heat sink and a cooling fan.

WARNING:

Do not wipe off (accidentally or otherwise) the pre-sprayed layer of thermal paste on the bottom of the heat sink. The thermal paste between the CPU and the heat sink is important for optimum heat dissipation.

To install the cooling kit, please follow the steps below.

Step 8: **Install the cooling kit bracket**. A cooling kit bracket is installed on the rear of the motherboard. Align the bracket with the four retention holes at the back of the motherboard. Once properly aligned, insert four retention screws from the front of the motherboard.

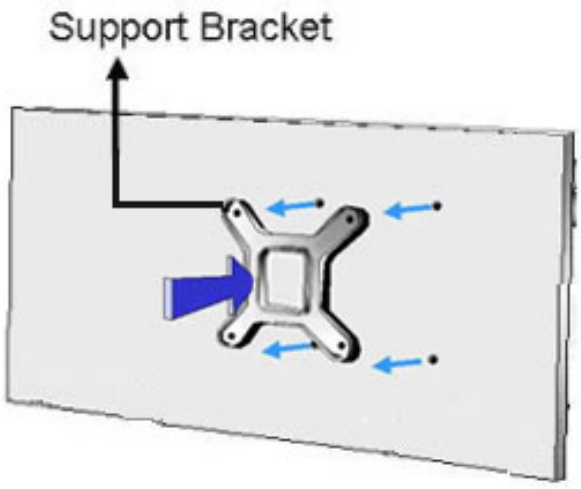


Figure 4-3: Cooling Kit Support Bracket

Step 9: **Open the lever at the top of the heat sink**. Lift the lever at the top of the cooling kit to loosen the cooling kit clamps.

Step 10: **Secure the cooling kit**. Gently place the heat sink and cooling kit onto the CPU. Make sure the hooks are properly secured to the bracket. To secure the cooling kit, close the top lever.

Step 11: **Connect the fan cable**. Connect the cooling kit fan cable to the fan connector on the ISP-9652/9602. Carefully route the cable and avoid heat generating chips and fan blades.

4.4.3 DIMM Installation

To install a DIMM module, please follow the steps below and refer to Figure 4-4.

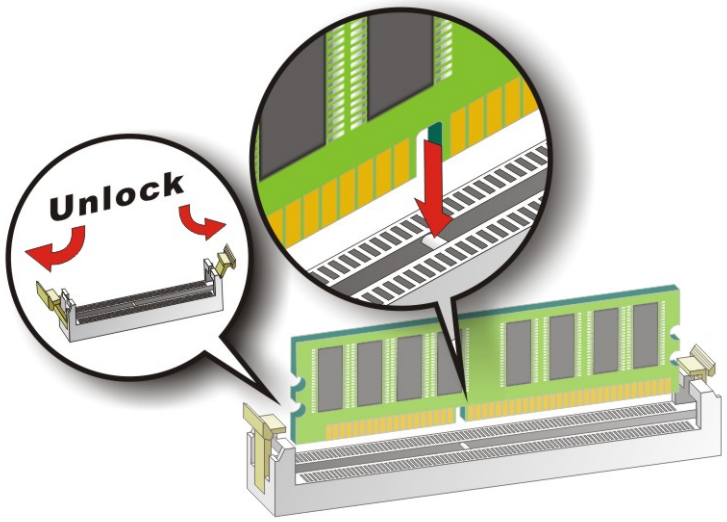


Figure 4-4: DIMM Installation

Step 1: **Open the DIMM socket handles**. Open the two handles outwards as far as they can. See Figure 4-4.

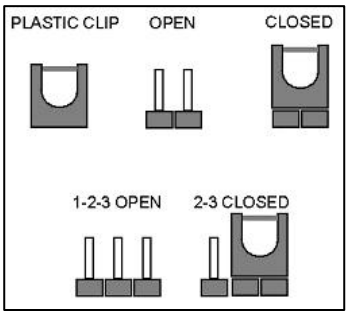
Step 2: **Align the DIMM with the socket**. Align the DIMM so the notch on the memory lines up with the notch on the memory socket. See Figure 4-4.

Step 3: **Insert the DIMM**. Once aligned, press down until the DIMM is properly seated. Clip the two handles into place. See Figure 4-4.

Step 4: **Removing a DIMM module**. To remove a DIMM, push both handles outward. The memory module is ejected by a mechanism in the socket.

4.5 Jumper Settings

NOTE:



A jumper is a metal bridge used to close an electrical circuit. It consists of two or three metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.

Before the ISP-9652/9602 is installed in the system, the jumpers must be set in accordance with the desired configuration. The jumpers on the ISP-9652/9602 are listed in **Table 4-1**.

Description	Label	Type
Clear CMOS	J_CMOS1	3-pin header
Embedded Controller Function Settings	JEC_SET1	20-pin header

Table 4-1: Jumpers

4.5.1 Clear CMOS Jumper

Jumper Label:	**J_CMOS1**
Jumper Type:	3-pin header
Jumper Settings:	See Table 4-2
Jumper Location:	See Figure 4-5

If the ISP-9652/9602 fails to boot due to improper BIOS settings, the clear CMOS jumper clears the CMOS data and resets the system BIOS information. To do this, use the jumper cap to close pins 2 and 3 for a few seconds then reinstall the jumper clip back to pins 1 and 2.

If the “CMOS Settings Wrong” message is displayed during the boot up process, the fault may be corrected by pressing the F1 to enter the CMOS Setup menu. Do one of the following:

- Enter the correct CMOS setting
- Load Optimal Defaults
- Load Failsafe Defaults.

After having done one of the above, save the changes and exit the CMOS Setup menu.

The clear CMOS jumper settings are shown in **Table 4-2**.

Clear CMOS	Description	
Short 1 - 2	Keep CMOS Setup	Default
Short 2 - 3	Clear CMOS Setup	

Table 4-2: Clear CMOS Jumper Settings

The location of the clear CMOS jumper is shown in **Figure 4-5** below.

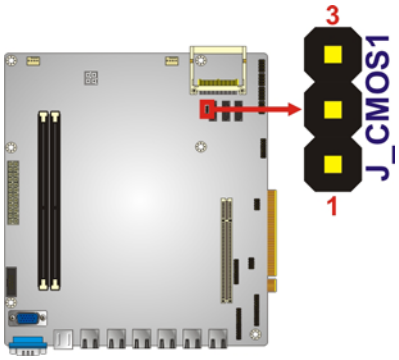


Figure 4-5: Clear CMOS Jumper

4.5.2 Embedded Controller Function Settings

Jumper Label: **JEC_SET1**

Jumper Type: 20-pin header

Jumper Settings: See **Table 4-3**, **Table 4-4**, **Table 4-5**, **Table 4-6**

Jumper Location: See **Figure 4-7**

The Embedded Controller Function Settings jumper controls the LAN Network Bypass MCU functions. Four functions are controlled by the jumper: SMB_ID, HW MCU Enable, ACK Count, and Bypass Function. The settings for these functions are described in the following subsections.

4.5.2.1 SMBUS Slave Address (SMB_ID)

System software can send commands to the Network Bypass MCU through SMBUS. Use the following jumper settings to select the SMBUS slave address.

Slave Address	Pin No. 3 - 4	Pin No. 5 - 6	Pin No. 7 - 8
0x60	Open	Open	Open
0x62	Open	Open	Short
0x64	Open	Short	Open
0x68	Short	Open	Open
0x6A	Short	Open	Short
0x6C	Short	Short	Open
0x6E	Short	Short	Short

Table 4-3: SMBUS Slave Address Jumper Settings

4.5.2.2 HW MCU Enable

Use the following settings to enable or disable the Network Bypass MCU. When disabled, the Network Bypass MCU function is in normal operation mode and cannot be changed. HW MCU must be enabled for the motherboard to function.

HM MCU Enable Function	Pin No. 19 - 20
Enable	Short
Disable	Open

Table 4-4: HW MCU Enable Jumper Settings

4.5.2.3 ACK Count

To set the countdown interval for SMBUS monitoring use the following jumper settings.

Interval	Pin No. 9 - 10	Pin No. 11 - 12	Pin No. 13 - 14	Pin No. 15 - 16
1 Second	Open	Open	Open	Open
2 Seconds	Open	Open	Open	Short
3 Seconds	Open	Open	Short	Open
4 Seconds	Open	Open	Short	Short
5 Seconds	Open	Short	Open	Open
6 Seconds	Open	Short	Open	Short
16 Seconds	Short	Short	Short	Short

Table 4-5: SMBUS Slave Address Jumper Settings

4.5.2.4 Bypass Function

The LAN Bypass feature removes a single point of failure so that essential business communication can continue while a network failure is diagnosed and resolved. In the event of a power, hardware or software failure, Hardware Bypass will automatically activate, allowing network traffic to continue. Traffic between the LAN and WAN is allowed without interruption. **Figure 4-6** illustrates the behavior of the dual-group LAN port Bypass modes.

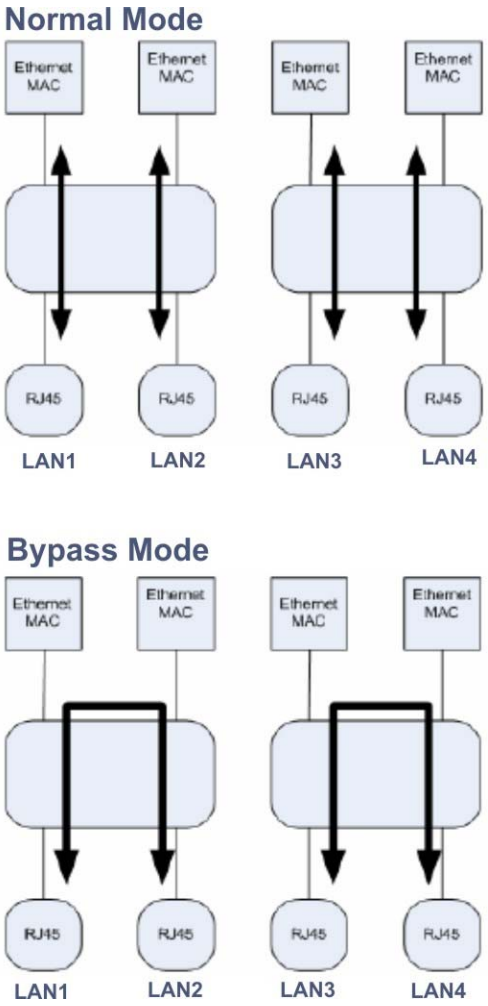


Figure 4-6: LAN Bypass Mode Behavior

Use following jumper settings to enable or disable the LAN sleep bypass function.

Bypass Function	Pin No. 1 - 2
Bypass mode	Short
Normal mode	Open

Table 4-6: HW MCU Enable Jumper Settings

The location of the **Embedded Controller Function Settings jumper** is shown in **Figure 4-7** below.

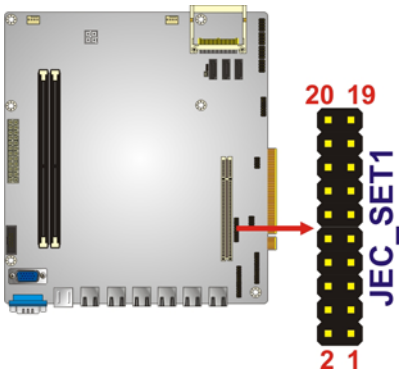


Figure 4-7: Embedded Controller Function Settings Jumper

4.6 Chassis Installation

4.6.1 Airflow

WARNING:

Airflow is critical to the cooling of the CPU and other onboard components. The chassis in which the ISP-9652/9602 must have air vents to allow cool air to move into the system and hot air to move out.

The ISP-9652/9602 must be installed in a chassis with ventilation holes on the sides allowing airflow to travel through the heat sink surface. In a system with an individual power supply unit, the cooling fan of a power supply can also help generate airflow through the board surface.

4.6.2 Motherboard Installation

To install the motherboard into the chassis please refer to the reference material that came with the chassis.

4.7 Internal Peripheral Device Connections

This section outlines the installation of peripheral devices to the onboard connectors.

4.7.1 12V CPU Power Connection

Follow the instructions below to connect the ATX power supply to the 12V CPU power connection on the ISP-9652/9602.

WARNING:

Disconnect the power supply power cord from its AC power source to prevent a sudden power surge to the ISP-9652/9602.

Step 5: **Locate the power cable**. The power cable is shown in the packing list in **Chapter 3**.

Step 6: **Connect the Power Cable to the Motherboard**. Connect the 4-pin (2x2) Molex type power cable connector to the 12V CPU power connector on the motherboard. See Figure 4-8.

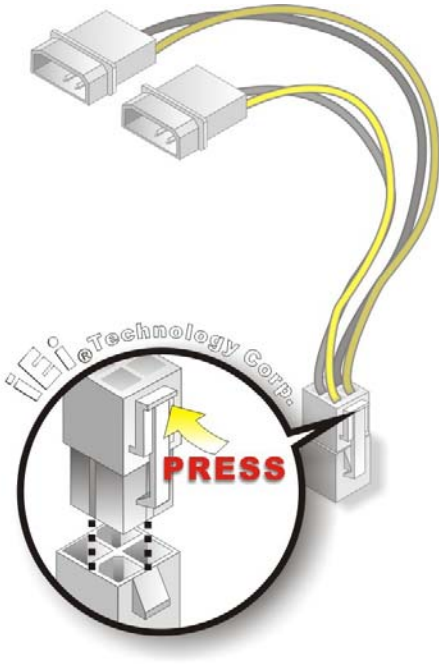


Figure 4-8: Power Cable to Motherboard 12V CPU Power Connection

Step 7: **Connect Power Cable to Power Supply**. Connect one of the 4-pin (1x4) Molex type power cable connectors to an ATX power supply. See Figure 4-9.

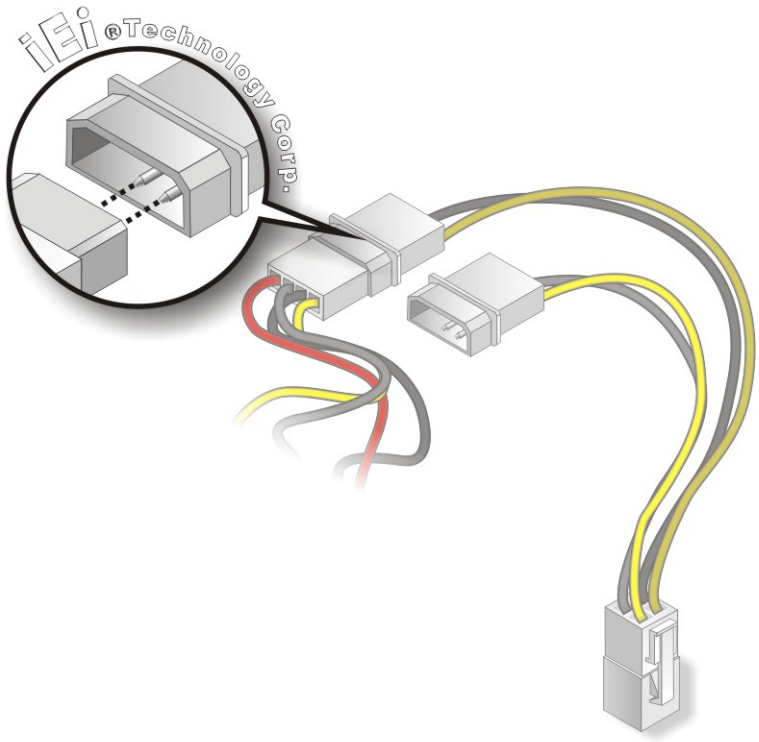


Figure 4-9: Connect Power Cable to Power Supply

4.7.2 SATA Drive Connection

The ISP-9652/9602 is shipped with three SATA drive cables. To connect the SATA drives to the connectors, please follow the steps below.

Step 8: **Locate the connectors**. The locations of the SATA drive connectors are shown in **Chapter 3**.

Step 9: **Insert the cable connector**. Press the clip on the connector at the end of the SATA cable and insert the cable connector into the onboard SATA drive connector. See **Figure 4-10**.

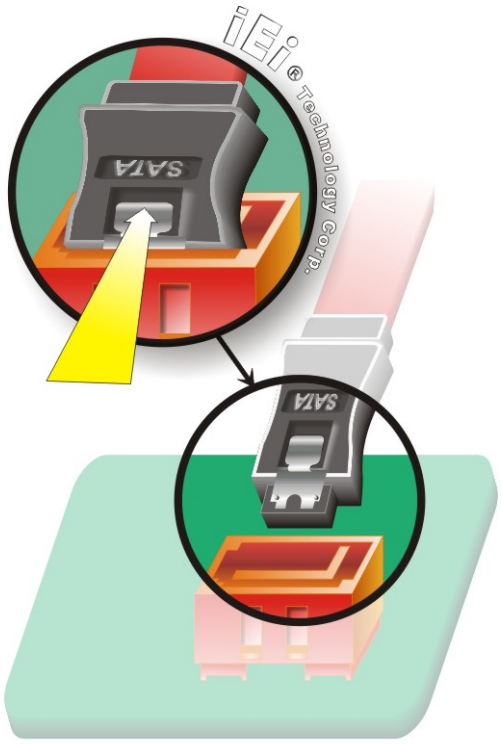


Figure 4-10: SATA Drive Cable Connection

Step 10: **Connect the cable to the SATA disk**. Connect the connector on the other end of the cable to the connector at the back of the SATA drive. See **Figure 4-12**.

4.7.3 Single RS-232 Cable (w/o Bracket)

The single RS-232 cable consists of one serial port connector attached to a serial communications cable that is then attached to a D-sub 9 male connector. To install the single RS-232 cable, please follow the steps below.

Step 11: **Locate the connector**. The location of the RS-232 connector is shown in **Chapter 3**.

Step 12: **Insert the cable connector**. Insert the connector into the serial port box header. See Figure 4-11. A key on the front of the cable connectors ensures the connector can only be installed in one direction.

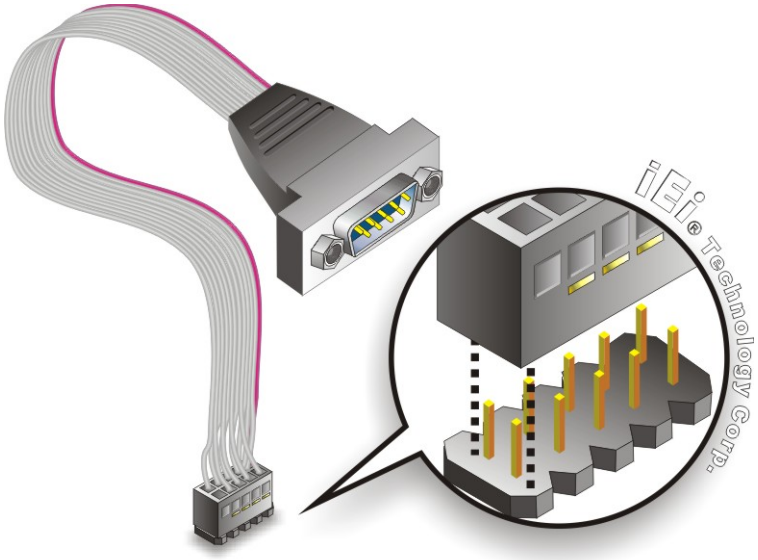


Figure 4-11: Single RS-232 Cable Installation

Step 13: **Secure the bracket**. The single RS-232 connector has two retention screws that must be secured to a chassis or bracket.

Step 14: **Connect the serial device**. Once the single RS-232 connector is connected to a chassis or bracket, a serial communications device can be connected to the system.

Figure 4-12: SATA Power Drive Connection

4.7.4 USB Cable (Four Port)

Four port USB 2.0 cables can be separately purchased from IEI. To install a four port USB cable onto the ISP-9652/9602, please follow the steps below.

Step 1: **Locate the connectors**. The locations of the USB connectors are shown in **Chapter 4**.

WARNING:

If the USB pins are not properly aligned, the USB device can burn out.

Step 2: **Align the connectors**. Each cable has two connectors. Correctly align pin 1on each cable connector with pin 1 on the ISP-9652/9602 USB connectors.

Step 3: **Insert the cable connectors**. Once the cable connectors are properly aligned with the USB connectors on the ISP-9652/9602, connect the cable connectors to the on-board connectors. See Figure 4-13.

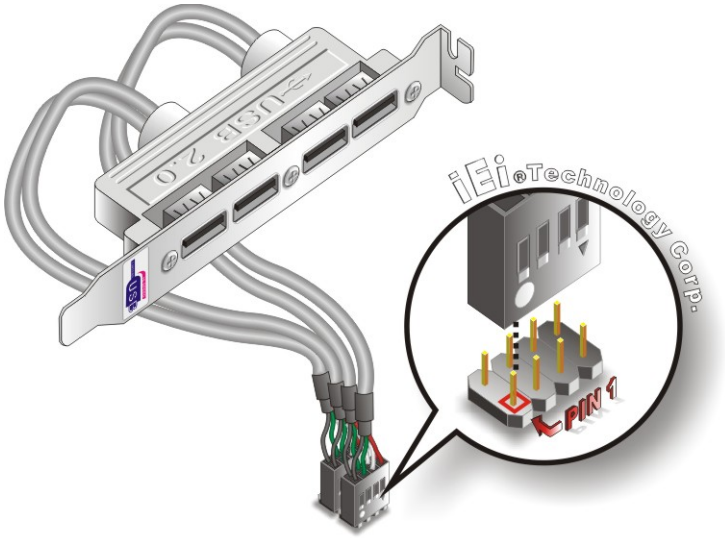


Figure 4-13: Four Port USB Cable Connection

Step 4: **Attach the bracket to the chassis**. The USB 2.0 connectors are attached to a bracket. To secure the bracket to the chassis please refer to the installation instructions that came with the chassis.

4.7.5 VGA Monitor Connection

The ISP-9652/9602 has a single onboard female DB-15 connector. The DB-15 connector is connected to a CRT or VGA monitor. To connect a monitor to the ISP-9652/9602, please follow the instructions below.

Step 1: **Locate the female DB-15 connector**. The location of the female DB-15 connector is shown in **Chapter 3**.

Step 2: **Align the VGA connector**. Align the male DB-15 connector on the VGA screen cable with the female DB-15 connector.

Step 3: **Insert the VGA connector**. Once the connectors are properly aligned with the insert the male connector from the VGA screen into the female connector on the ISP-9652/9602. See **Figure 4-14**.

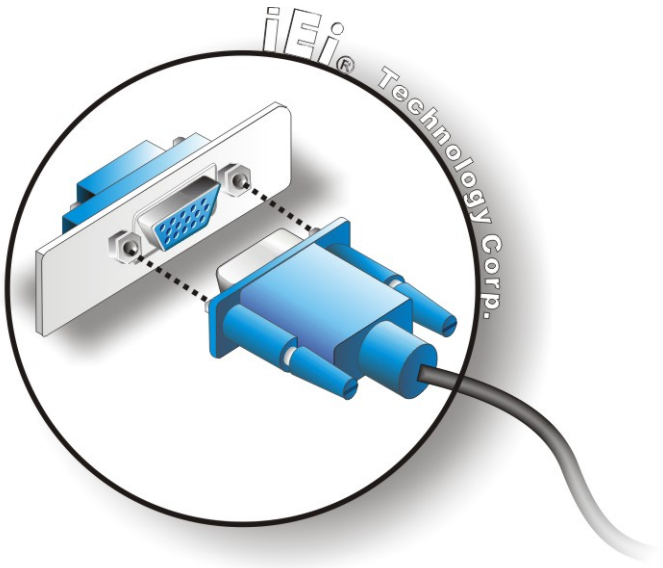


Figure 4-14: VGA Connector

Step 4: **Secure the connector**. Secure the DB-15 VGA connector from the VGA monitor to the internal interface by tightening the two retention screws on either side of the connector.

4.8 External Peripheral Interface Connection

The following external peripheral devices can be connected to the external peripheral interface connectors.

- RJ-45 Ethernet cable connectors
- USB devices
- VGA monitors

To install these devices, connect the corresponding cable connector from the actual device to the corresponding ISP-9652/9602 external peripheral interface connector making sure the pins are properly aligned.

4.8.1 LAN Connection

There are six external RJ-45 LAN connectors. The RJ-45 connectors enable connection to an external network. To connect a LAN cable with an RJ-45 connector, please follow the instructions below.

Step 1: **Locate the RJ-45 connectors**. The locations of the USB connectors are shown in **Chapter 4**.

Step 2: **Align the connectors.** Align the RJ-45 connector on the LAN cable with one of the RJ-45 connectors on the ISP-9652/9602. See **Figure 4-15**.

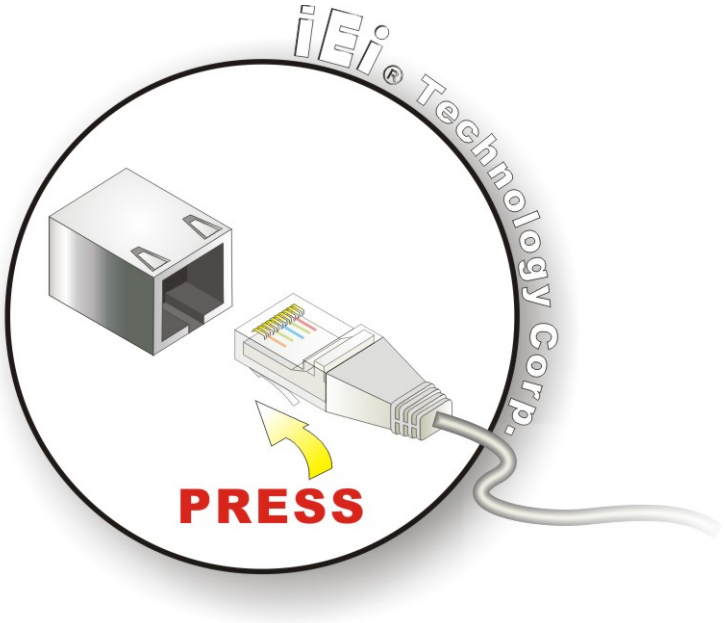


Figure 4-15: LAN Connection

Step 3: **Insert the LAN cable RJ-45 connector.** Once aligned, gently insert the LAN cable RJ-45 connector into the onboard RJ-45 connector.

4.8.2 USB Connection (Dual Connector)

The external USB Series "A" receptacle connectors provide easier and quicker access to external USB devices. Follow the steps below to connect USB devices to the ISP-9652/9602.

Step 1: **Locate the USB Series "A" receptacle connectors**. The location of the USB Series "A" receptacle connectors are shown in **Chapter 3**.

Step 2: **Insert a USB Series "A" plug**. Insert the USB Series "A" plug of a device into the USB Series "A" receptacle on the external peripheral interface. See **Figure** 4-16.

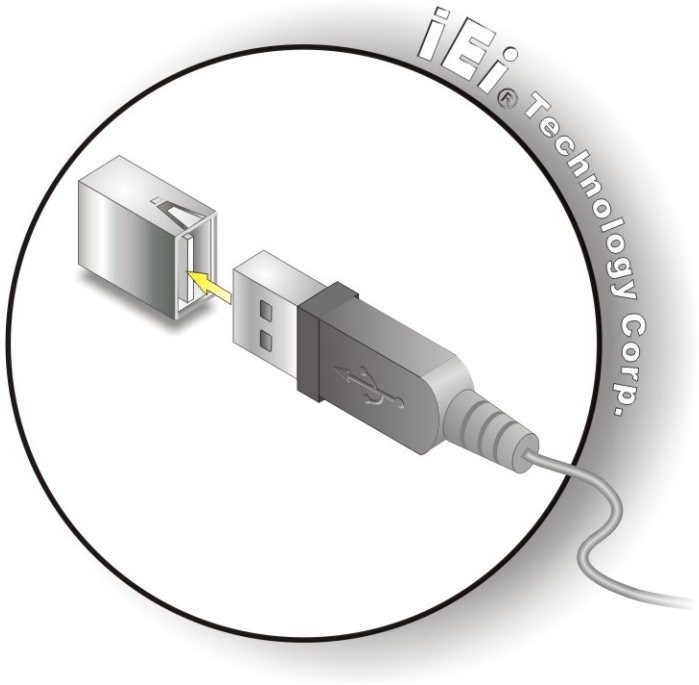


Figure 4-16: USB Connector

4.9 Software Installation

All the drivers for the ISP-9652/9602 are on the CD that came with the system. To install the drivers, please follow the steps below.

Step 3: Insert the CD into a CD drive connected to the system.

NOTE:

If the installation program doesn't start automatically:
Click "Start->My Computer->CD Drive->autorun.exe"

Step 4: The driver main menu appears (**Figure 4-17**).

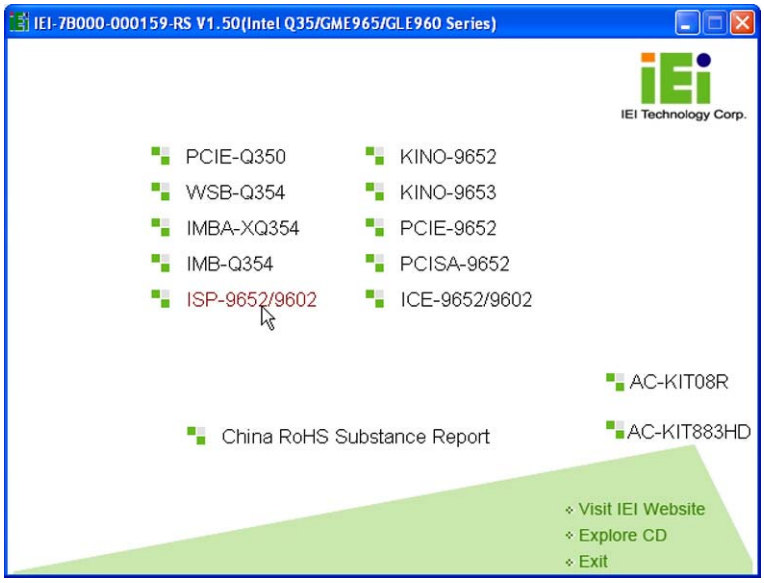


Figure 4-17: Introduction Screen

Step 5: Click **ISP-9652/9602**.

Step 6: A new screen with a list of available drivers appears (**Figure 4-18**).

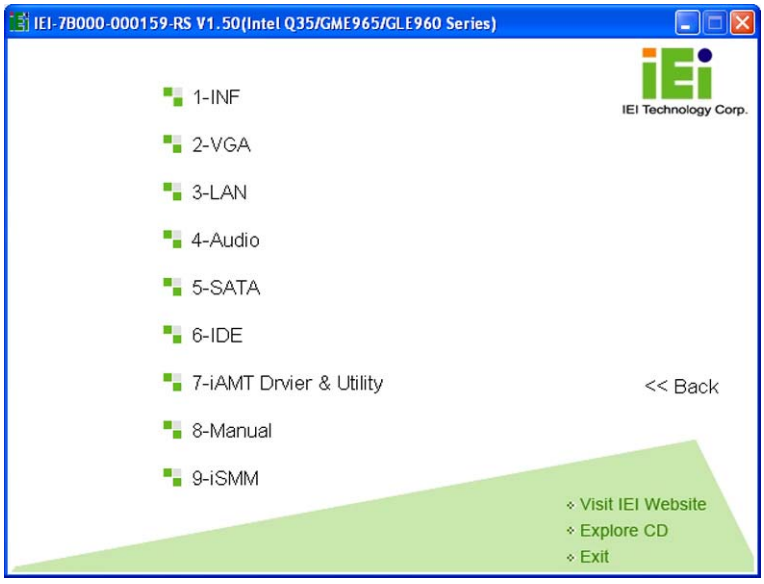


Figure 4-18: Available Drivers

Step 7: Install all of the necessary drivers in this menu.

Chapter

5

BIOS Screens

5.1 Introduction

The BIOS is programmed onto the BIOS chip. The BIOS setup program allows changes to certain system settings. This chapter outlines the options that can be changed.

5.1.1 Starting Setup

The AMI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. Press the **DELETE** key as soon as the system is turned on or
2. Press the **DELETE** key when the "**Press Del to enter SETUP**" message appears on the screen.

If the message disappears before the **DELETE** key is pressed, restart the computer and try again.

5.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, use the PageUp and PageDown keys to change entries, press **F1** for help and press **ESC** to quit. Navigation keys are shown in.

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
Esc key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
Page Up key	Increase the numeric value or make changes
Page Dn key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu

Key	Function
F2 /F3 key	Change color from total 16 colors. F2 to select color forward.
F10 key	Save all the CMOS changes, only for Main Menu

Table 5-1: BIOS Navigation Keys

5.1.3 Getting Help

When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press **Esc** or the **F1** key again.

5.1.4 Unable to Reboot After Configuration Changes

If the computer cannot boot after changes to the system configuration is made, CMOS defaults. Use the jumper described in Chapter **5**.

5.1.5 BIOS Menu Bar

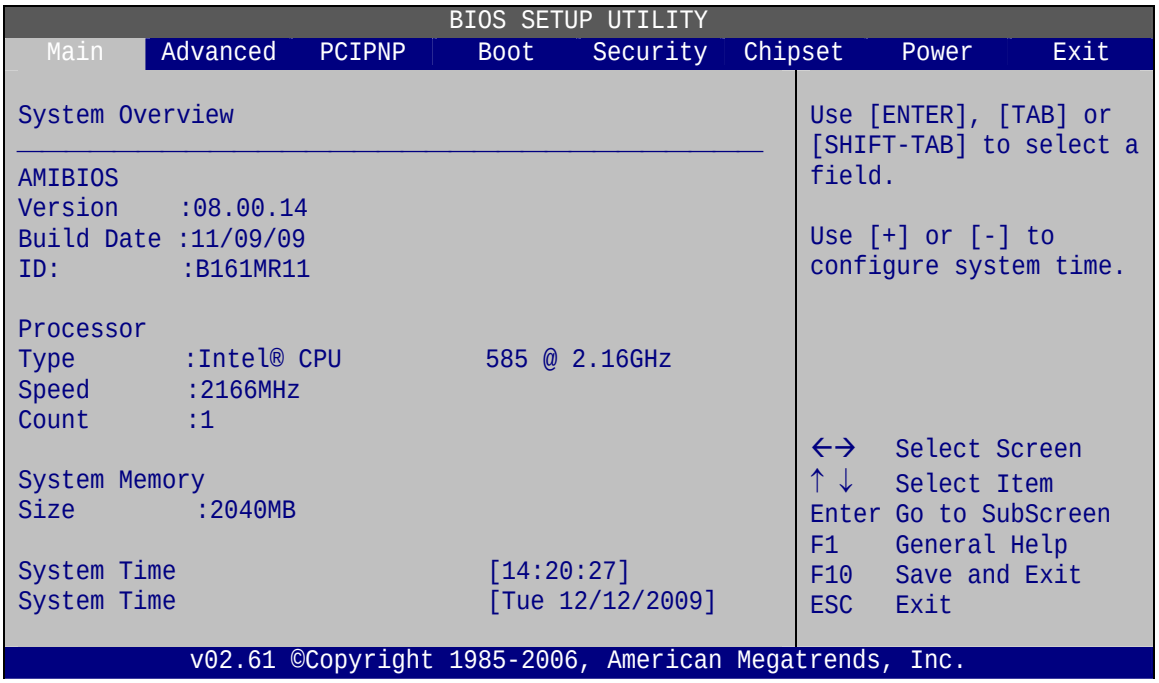
The **menu bar** on top of the BIOS screen has the following main items:

- Main – Changes the basic system configuration.
- Advanced – Changes the advanced system settings.
- PCIPnP – Changes the advanced PCI/PnP Settings
- Boot – Changes the system boot configuration.
- Security – Sets User and Supervisor Passwords.
- Chipset – Changes the chipset settings.
- Power – Changes power management settings.
- Exit – Selects exit options and loads default settings

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

5.2 Main

The **Main** BIOS menu (**BIOS Menu 1**) appears when the **BIOS Setup** program is entered. The **Main** menu gives an overview of the basic system information.



BIOS Menu 1: Main

➔ System Overview

The **System Overview** lists a brief summary of different system components. The fields in **System Overview** cannot be changed. The items shown in the system overview include:

- AMI BIOS: Displays auto-detected BIOS information
  - **Version:** Current BIOS version
  - **Build Date:** Date the current BIOS version was made
  - **ID:** Installed BIOS ID
- Processor: Displays auto-detected CPU specifications
  - **Type:** Names the currently installed processor
  - **Speed:** Lists the processor speed
  - **Count:** The number of CPUs on the motherboard
- System Memory: Displays the auto-detected system memory.
  - **Size:** Lists memory size

The System Overview field also has two user configurable fields:

➔ **System Time [xx:xx:xx]**

Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.

➔ **System Date [xx/xx/xx]**

Use the **System Date** option to set the system date. Manually enter the day, month and year.

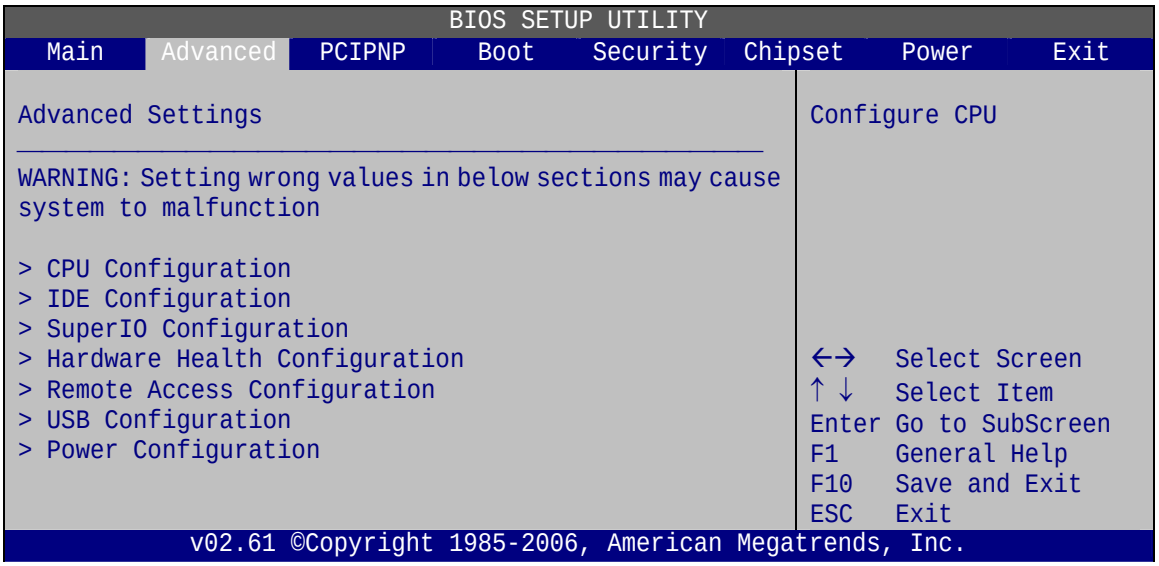
5.3 Advanced

Use the **Advanced** menu (**BIOS Menu 2**) to configure the CPU and peripheral devices through the following sub-menus:

WARNING!

Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.

- CPU Configuration (see **Section 5.3.1**)
- IDE Configuration (see **Section 5.3.2**)
- Super IO Configuration (**Section 5.3.3)**
- Hardware Health Configuration (see **Section 5.3.4**)
- Remote Access Configuration (see **Section 5.3.5**)
- USB Configuration (see **Section 5.3.6**)
- Power Configuration (see **Section 5.3.7**)


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Power Exit
Advanced Settings
WARNING: Setting wrong values in below sections may cause system to malfunction
> CPU Configuration
> IDE Configuration
> SuperIO Configuration
> Hardware Health Configuration
> Remote Access Configuration
> USB Configuration
> Power Configuration
Configure CPU
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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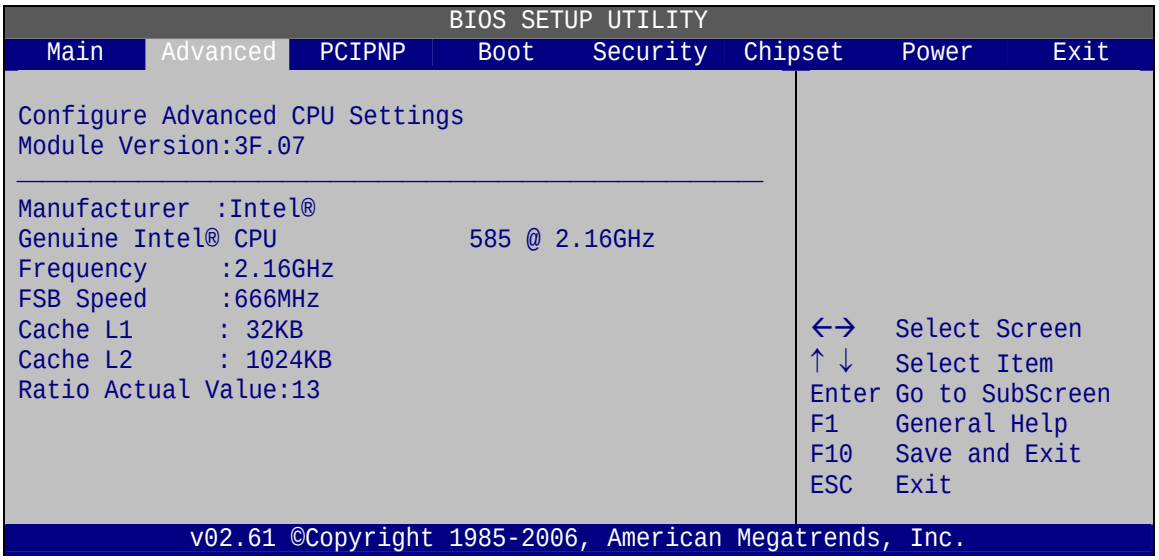
BIOS Menu 2: Advanced

5.3.1 CPU Configuration

Use the **CPU Configuration** menu (**BIOS Menu 3**) to view detailed CPU specifications and configure the CPU.



BIOS Menu 3: CPU Configuration

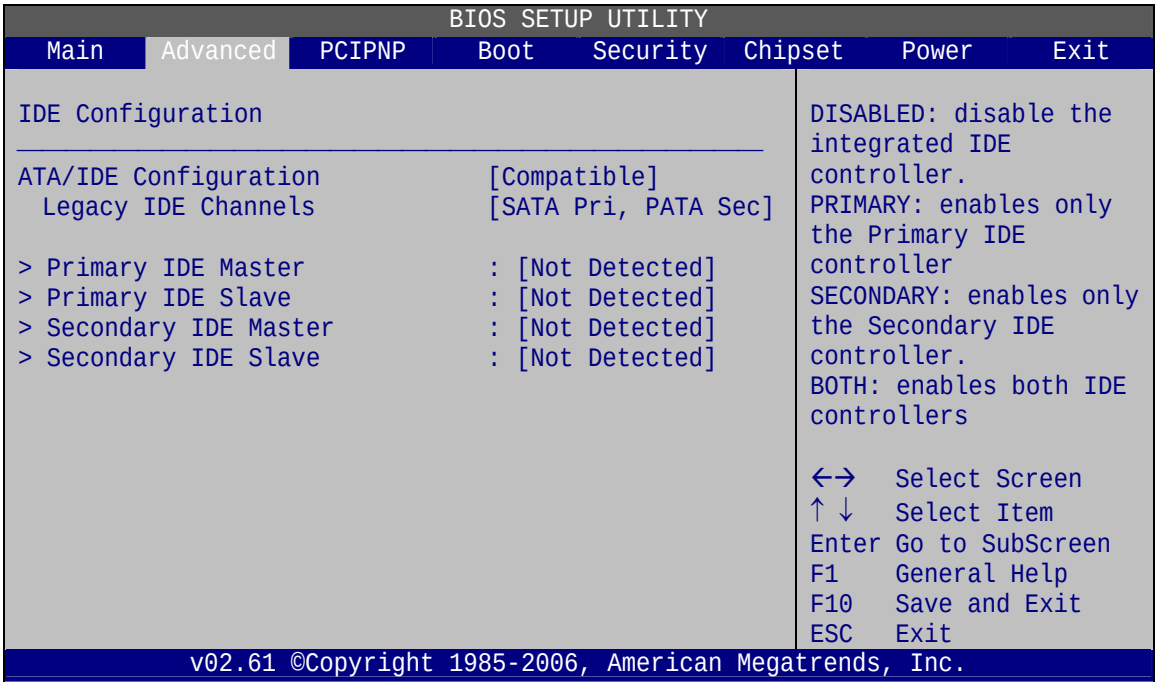
The CPU Configuration menu (**BIOS Menu 3**) lists the following CPU details:

- Manufacturer: Lists the name of the CPU manufacturer
- Brand String: Lists the brand name of the CPU being used

- Frequency: Lists the CPU processing speed
- FSB Speed: Lists the FSB speed
- Cache L1: Lists the CPU L1 cache size
- Cache L2: Lists the CPU L2 cache size

5.3.2 IDE Configuration

Use the **IDE Configuration** menu (**BIOS Menu 4**) to change and/or set the configuration of the IDE devices installed in the system.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Power Exit
IDE Configuration
ATA/IDE Configuration [Compatible]
Legacy IDE Channels [SATA Pri, PATA Sec]
> Primary IDE Master : [Not Detected]
> Primary IDE Slave : [Not Detected]
> Secondary IDE Master : [Not Detected]
> Secondary IDE Slave : [Not Detected]
DISABLED: disable the integrated IDE controller.
PRIMARY: enables only the Primary IDE controller
SECONDARY: enables only the Secondary IDE controller.
BOTH: enables both IDE controllers
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 4: IDE Configuration

➔ **ATA/IDE Configuration [Compatible]**

Use the **ATA/IDE Configuration** option to configure the ATA/IDE controller.

➔ **Disabled** Disables the on-board ATA/IDE controller.

➔ **Compatible** **DEFAULT** Configures the on-board ATA/IDE controller to be in compatible mode. In this mode, a SATA channel will replace one of the IDE channels. This mode supports up to 4 storage devices.

➔ **Enhanced** Configures the on-board ATA/IDE controller to be in Enhanced mode. In this mode, IDE channels and SATA channels are separated. This mode supports up to 6 storage devices. Some legacy OS do not support this mode.

➔ **Configure SATA as [IDE]**

Use the **Configure SATA as** option to configure SATA devices as normal IDE devices.

➔ **IDE** **DEFAULT** Configures SATA devices as normal IDE device.

➔ **AHCI** Configures SATA devices as normal AHCI device.

➔ **IDE Master and IDE Slave**

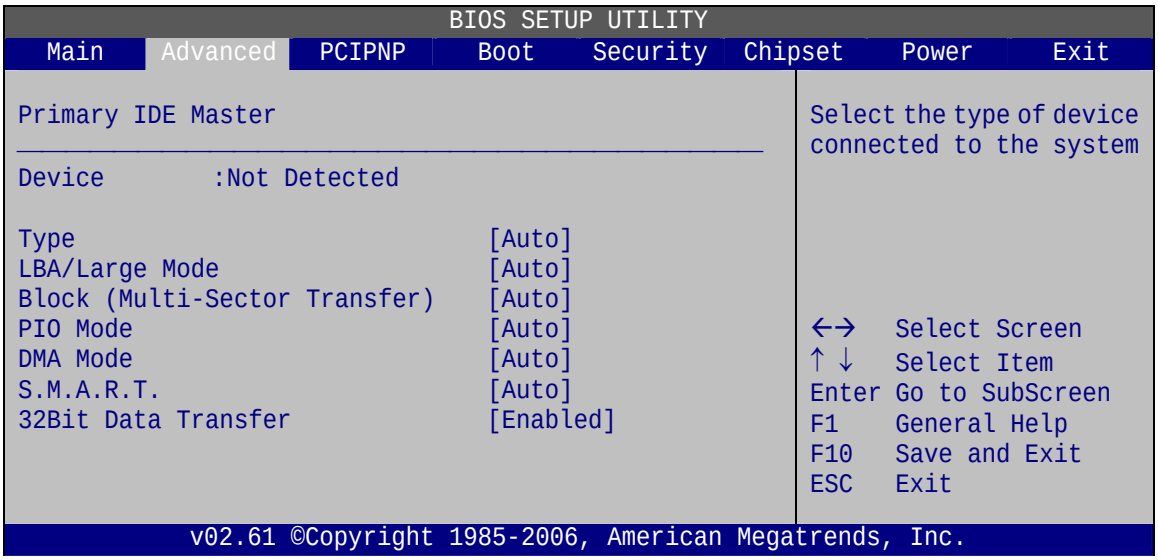
When entering setup, BIOS automatically detects the presence of IDE devices. BIOS displays the status of the auto detected IDE devices. The following IDE devices are detected and are shown in the **IDE Configuration** menu:

- Primary IDE Master
- Primary IDE Slave
- Secondary IDE Master
- Secondary IDE Slave

The **IDE Configuration** menu (**BIOS Menu 4**) allows changes to the configurations for the IDE devices installed in the system. If an IDE device is detected and one of the above listed four BIOS configuration options are selected, the IDE configuration options shown in **Section 5.3.2.1** appear.

5.3.2.1 IDE Master, IDE Slave

Use the **IDE Master** and **IDE Slave** configuration menu to view both primary and secondary IDE device details and configure the IDE devices connected to the system.



BIOS Menu 5: IDE Master and IDE Slave Configuration

➔ Auto-Detected Drive Parameters

The "grayed-out" items in the left frame are IDE disk drive parameters automatically detected from the firmware of the selected IDE disk drive. The drive parameters are listed as follows:

- Device: Lists the device type (e.g. hard disk, CD-ROM etc.)
- Type: Indicates the type of devices a user can manually select
- Vendor: Lists the device manufacturer
- Size: List the storage capacity of the device.
- LBA Mode: Indicates whether the LBA (Logical Block Addressing) is a method of addressing data on a disk drive is supported or not.
- Block Mode: Block mode boosts IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if block mode is not used. Block mode allows transfers of up to 64 KB per interrupt.
- PIO Mode: Indicates the PIO mode of the installed device.
- Async DMA: Indicates the highest Asynchronous DMA Mode that is supported.
- Ultra DMA: Indicates the highest Synchronous DMA Mode that is supported.
- S.M.A.R.T.: Indicates whether or not the Self-Monitoring Analysis and Reporting Technology protocol is supported.

- 32Bit Data Transfer: Enables 32-bit data transfer.

➔ **Type [Auto]**

Use the **Type** BIOS option select the type of device the AMIBIOS attempts to boot from after the Power-On Self-Test (POST) is complete.

➔ **Not Installed**		BIOS is prevented from searching for an IDE disk drive on the specified channel.
➔ **Auto**	**DEFAULT**	The BIOS auto detects the IDE disk drive type attached to the specified channel. This setting should be used if an IDE hard disk drive is attached to the specified channel.
➔ **CD/DVD**		The CD/DVD option specifies that an IDE CD-ROM drive is attached to the specified IDE channel. The BIOS does not attempt to search for other types of IDE disk drives on the specified channel.
➔ **ARMD**		This option specifies an ATAPI Removable Media Device. These include, but are not limited to: ZIP LS-120

➔ **LBA/Large Mode [Auto]**

Use the **LBA/Large Mode** option to disable or enable BIOS to auto detects LBA (Logical Block Addressing). LBA is a method of addressing data on a disk drive. In LBA mode, the maximum drive capacity is 137 GB.

➔ **Disabled**		BIOS is prevented from using the LBA mode control on the specified channel.
➔ **Auto**	**DEFAULT**	BIOS auto detects the LBA mode control on the specified channel.

➔ **Block (Multi Sector Transfer) [Auto]**

Use the **Block (Multi Sector Transfer)** to disable or enable BIOS to auto detect if the device supports multi-sector transfers.

➔ **Disabled**		BIOS is prevented from using Multi-Sector Transfer on the specified channel. The data to and from the device occurs one sector at a time.
➔ **Auto**	**DEFAULT**	BIOS auto detects Multi-Sector Transfer support on the drive on the specified channel. If supported the data transfer to and from the device occurs multiple sectors at a time.

➔ **PIO Mode [Auto]**

Use the **PIO Mode** option to select the IDE PIO (Programmable I/O) mode program timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases.

➔ **Auto**	**DEFAULT**	BIOS auto detects the PIO mode. Use this value if the IDE disk drive support cannot be determined.
➔ **0**		PIO mode 0 selected with a maximum transfer rate of 3.3 MB/s
➔ **1**		PIO mode 1 selected with a maximum transfer rate of 5.2 MB/s
➔ **2**		PIO mode 2 selected with a maximum transfer rate of 8.3 MB/s
➔ **3**		PIO mode 3 selected with a maximum transfer rate of 11.1 MB/s
➔ **4**		PIO mode 4 selected with a maximum transfer rate of 16.6 MB/s (This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE CD-ROM drives, check the specifications of the drive.)

➔ **DMA Mode [Auto]**

Use the **DMA Mode** BIOS selection to adjust the DMA mode options.

➔ **Auto**	**DEFAULT**	BIOS auto detects the DMA mode. Use this value if the IDE disk drive support cannot be determined.
➔ **SWDMA0**		Single Word DMA mode 0 selected with a maximum data transfer rate of 2.1 MB/s
➔ **SWDMA1**		Single Word DMA mode 1 selected with a maximum data transfer rate of 4.2 MB/s
➔ **SWDMA2**		Single Word DMA mode 2 selected with a maximum data transfer rate of 8.3 MB/s
➔ **MWDMA0**		Multi Word DMA mode 0 selected with a maximum data transfer rate of 4.2 MB/s
➔ **MWDMA1**		Multi Word DMA mode 1 selected with a maximum data transfer rate of 13.3 MB/s
➔ **MWDMA2**		Multi Word DMA mode 2 selected with a maximum data transfer rate of 16.6 MB/s
➔ **UDMA0**		Ultra DMA mode 0 selected with a maximum data transfer rate of 16.6 MB/s
➔ **UDMA1**		Ultra DMA mode 1 selected with a maximum data transfer rate of 25 MB/s
➔ **UDMA2**		Ultra DMA mode 2 selected with a maximum data transfer rate of 33.3 MB/s
➔ **UDMA3**		Ultra DMA mode 3 selected with a maximum data transfer rate of 44 MB/s (To use this mode, it is required that an 80-conductor ATA cable is used.)
➔ **UDMA4**		Ultra DMA mode 4 selected with a maximum data transfer rate of 66.6 MB/s (To use this mode, it is required that an 80-conductor ATA cable is used.)
➔ **UDMA5**		Ultra DMA mode 5 selected with a maximum data transfer rate of 99.9 MB/s (To use this mode, it is required that an 80-conductor ATA cable is used.)

➔ **S.M.A.R.T [Auto]**

Use the **S.M.A.R.T** option to auto-detect, disable or enable Self-Monitoring Analysis and Reporting Technology (SMART) on the drive on the specified channel. **S.M.A.R.T** predicts impending drive failures. The **S.M.A.R.T** BIOS option enables or disables this function.

➔ **Auto**	**DEFAULT**	BIOS auto detects HDD SMART support.
➔ **Disabled**		Prevents BIOS from using the HDD SMART feature.
➔ **Enabled**		Allows BIOS to use the HDD SMART feature

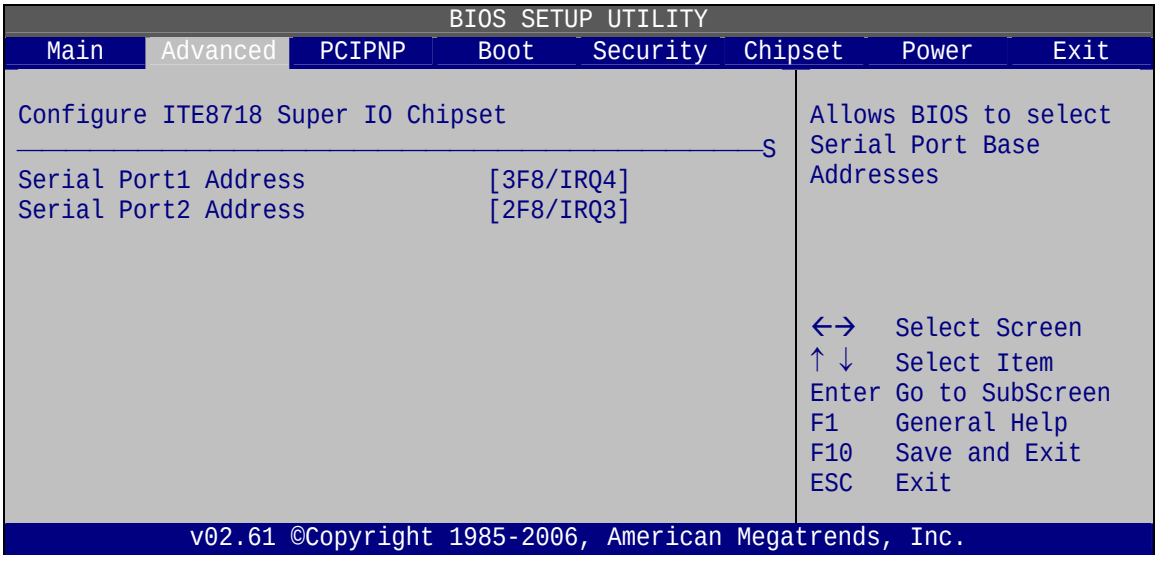
➔ **32Bit Data Transfer [Enabled]**

Use the **32Bit Data Transfer** BIOS option to enables or disable 32-bit data transfers.

➔ **Disabled**		Prevents the BIOS from using 32-bit data transfers.
➔ **Enabled**	**DEFAULT**	Allows BIOS to use 32-bit data transfers on supported hard disk drives.

5.3.3 Super IO Configuration

Use the **Super IO Configuration** menu (**BIOS Menu 6**) to set or change the configurations for the FDD controllers, parallel ports and serial ports.



BIOS Menu 6: Super IO Configuration

➔ **Serial Port1 Address [3E8]**

Use the **Serial Port1 Address** option to select the Serial Port 1 base address.

➔ **Disabled**		No base address is assigned to Serial Port 1
➔ **3F8/IRQ4**	**DEFAULT**	Serial Port 1 I/O port address is 3F8 and the interrupt address is IRQ4
➔ **3E8/IRQ4**		Serial Port 1 I/O port address is 3E8 and the interrupt address is IRQ4
➔ **2E8/IRQ3**		Serial Port 1 I/O port address is 2E8 and the interrupt address is IRQ3

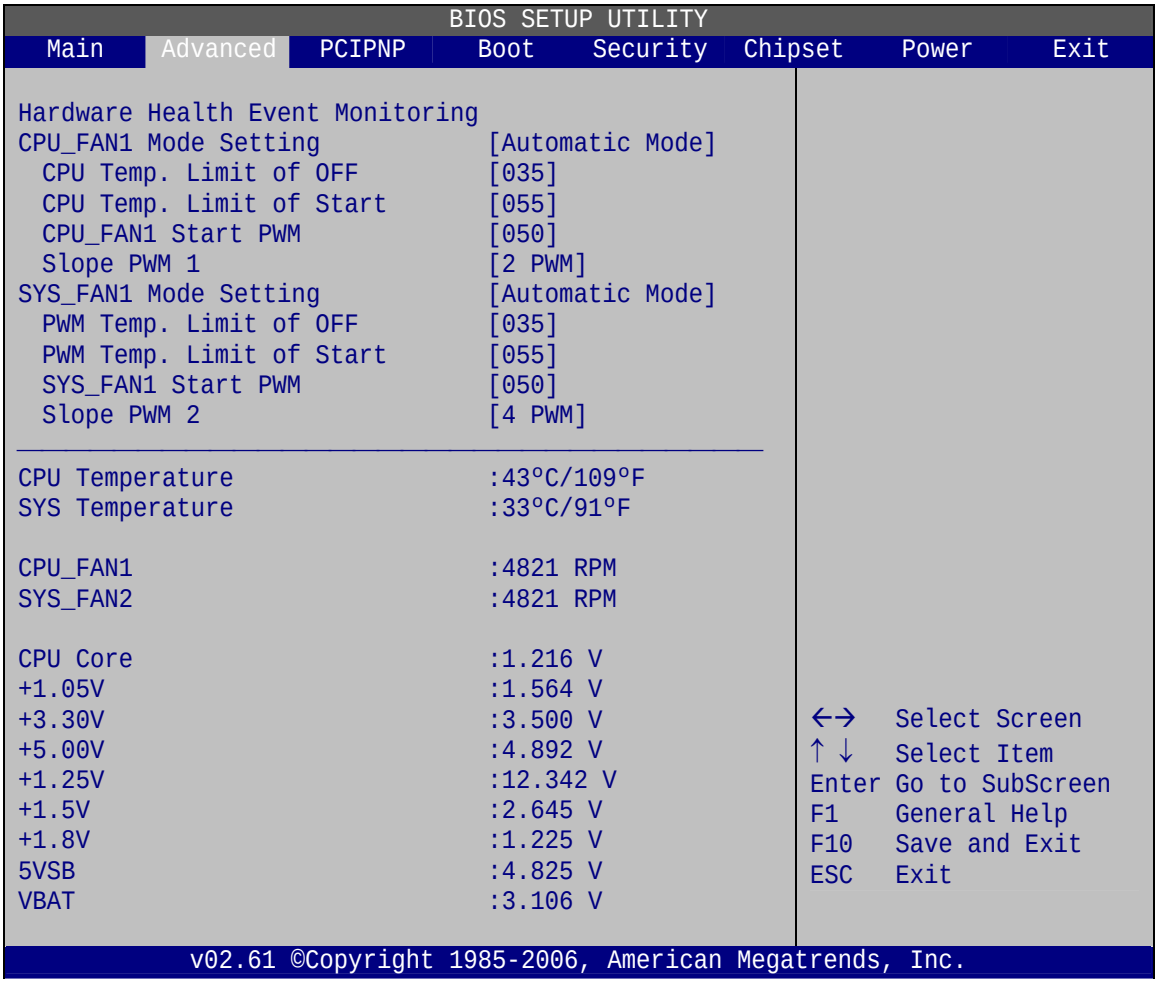
➔ **Serial Port2 Address [2E8]**

Use the **Serial Port2 Address** option to select the Serial Port 2 base address.

➔ **Disabled**		No base address is assigned to Serial Port 2
➔ **2F8/IRQ3**	**DEFAULT**	Serial Port 1 I/O port address is 2F8 and the interrupt address is IRQ3
➔ **3E8/IRQ4**		Serial Port 1 I/O port address is 3E8 and the interrupt address is IRQ4
➔ **2E8/IRQ3**		Serial Port 1 I/O port address is 2E8 and the interrupt address is IRQ3

5.3.4 Hardware Health Configuration

The **Hardware Health Configuration** menu (**BIOS Menu 7**) shows the operating temperature, fan speeds and system voltages.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Power Exit
Hardware Health Event Monitoring
CPU_FAN1 Mode Setting [Automatic Mode]
CPU Temp. Limit of OFF [035]
CPU Temp. Limit of Start [055]
CPU_FAN1 Start PWM [050]
Slope PWM 1 [2 PWM]
SYS_FAN1 Mode Setting [Automatic Mode]
PWM Temp. Limit of OFF [035]
PWM Temp. Limit of Start [055]
SYS_FAN1 Start PWM [050]
Slope PWM 2 [4 PWM]
CPU Temperature :43°C/109°F
SYS Temperature :33°C/91°F
CPU_FAN1 :4821 RPM
SYS_FAN2 :4821 RPM
CPU Core :1.216 V
+1.05V :1.564 V
+3.30V :3.500 V
+5.00V :4.892 V
+1.25V :12.342 V
+1.5V :2.645 V
+1.8V :1.225 V
5VSB :4.825 V
VBAT :3.106 V
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 7: Hardware Health Configuration

➔ **Mode Setting [Full On Mode]**

Use the **Mode Setting** option to configure the second fan.

➔ **Full On Mode** **DEFAULT** Fan is on all the time

➔ **Automatic mode** The fan adjusts its speed using these settings:

- Temp. Limit of OFF
- Temp. Limit of Start
- Fan Start PWM
- Slope PWM 1

➔ **PWM Manual mode** The fan spins at the speed set in:

- Fan PWM control

➔ **Temp. Limit of OFF [000]**

WARNING:

CPU failure can result if this value is set too high

The fan will turn off if the temperature falls below this value.

- Minimum Value: 0°C
- Maximum Value: 127°C

➔ **Temp. Limit of Start [020]**

WARNING:

CPU failure can result if this value is set too high

When the fan is off, it will only start when the temperature exceeds this setting.

- Minimum Value: 0°C
- Maximum Value: 127°C

➔ **Start PWM [070]**

This is the initial speed of the fan when it first starts spinning.

- PWM Minimum Mode: 0

- PWM Maximum Mode: 127

➔ **Slope PWM [1 PWM]**

A bigger value will increase the fan speed in big amounts. A smaller value will increase the speed more gradually.

- 0 PWM
- 1 PWM
- 2 PWM
- 4 PWM
- 8 PWM
- 16 PWM
- 32 PWM
- 64 PWM

➔ **CPU Fan PWM Control [070]**

This value specifies the speed of the fan.

- PWM Minimum Mode: 0
- PWM Maximum Mode: 127

➔ **H/W Health Function [Enabled]**

Use the **H/W Health Function** to enable the monitoring of the system environmental parameters.

➔ **Disabled**		Disables the health monitoring function
➔ **Enabled**	**DEFAULT**	Enables the health monitoring function

➔ **Hardware Health Monitoring**

The following system parameters and values are shown. The system parameters that are monitored are:

- System Temperatures:
  - CPU Temperature

- System Temperature

- Fan Speeds:
  - CPU_Fan1 Speed
  - SYS_Fan2 Speed
- Voltages:
  - CPU Core
  - +1.05V
  - +3.30V
  - +5.00V
  - +1.25V
  - +1.5V
  - +1.8V
  - 5VSB
  - VBAT

5.3.5 Remote Access Configuration

Use the **Remote Access Configuration** menu (**BIOS Menu 8**) to configure remote access parameters. The **Remote Access Configuration** is an AMIBIOS feature and allows a remote host running a terminal program to display and configure the BIOS settings.

```
                        BIOS SETUP UTILITY
Main  Advanced  PCIPNP  Boot  Security  Chipset  Power  Exit

Configure Remote Access type and parameters
-------------------------------------------------------------
Remote Access                    [Disabled]

Serial port number               [COM1]
     Base Address, IRQ           [3F8H, 4]
Serial Port Mode                 [115200 8,n,1]
Redirection After BIOS POST      [Always]
Terminal Type                    [ANSI]

                                 ←→   Select Screen
                                 ↑ ↓  Select Item
                                 Enter Go to SubScreen
                                 F1    General Help
                                 F10   Save and Exit
                                 ESC   Exit

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```

BIOS Menu 8: Remote Access Configuration

➔ **Remote Access [Disabled]**

Use the **Remote Access** option to enable or disable access to the remote functionalities of the system.

➔ **Disabled**	**DEFAULT**	Remote access is disabled.
➔ **Enabled**		Remote access configuration options shown below appear: Serial Port Number Serial Port Mode Redirection after BIOS POST Terminal Type These configuration options are discussed below.

➔ **Serial Port Number [COM1]**

Use the **Serial Port Number** option allows to select the serial port used for remote access.

➔ **COM1**	**DEFAULT**	System is remotely accessed through COM1
➔ **COM2**		System is remotely accessed through COM2

NOTE: Make sure the selected COM port is enabled through the Super I/O configuration menu.

➔ **Base Address, IRQ [3E8h, A]**

The **Base Address, IRQ** option cannot be configured and only shows the interrupt address of the serial port listed above.

➔ **Serial Port Mode [115200 8,n,1]**

Use the **Serial Port Mode** option to select baud rate through which the console redirection is made. The following configuration options are available

- 115200 8,n,1 **DEFAULT**
- 57600 8,n,1

- 38400 8,n,1
- 19200 8,n,1
- 09600 8,n,1

NOTE:

Identical baud rate setting musts be set on the host (a management computer running a terminal software) and the slave

➔ **Redirection After BIOS POST [Always]**

Use the **Redirection After BIOS POST** option to specify when console redirection should occur.

➔ **Disabled**		The console is not redirected after POST
➔ **Boot Loader**		Redirection is active during POST and during Boot Loader
➔ **Always**	**DEFAULT**	Redirection is always active (Some OSes may not work if set to Always)

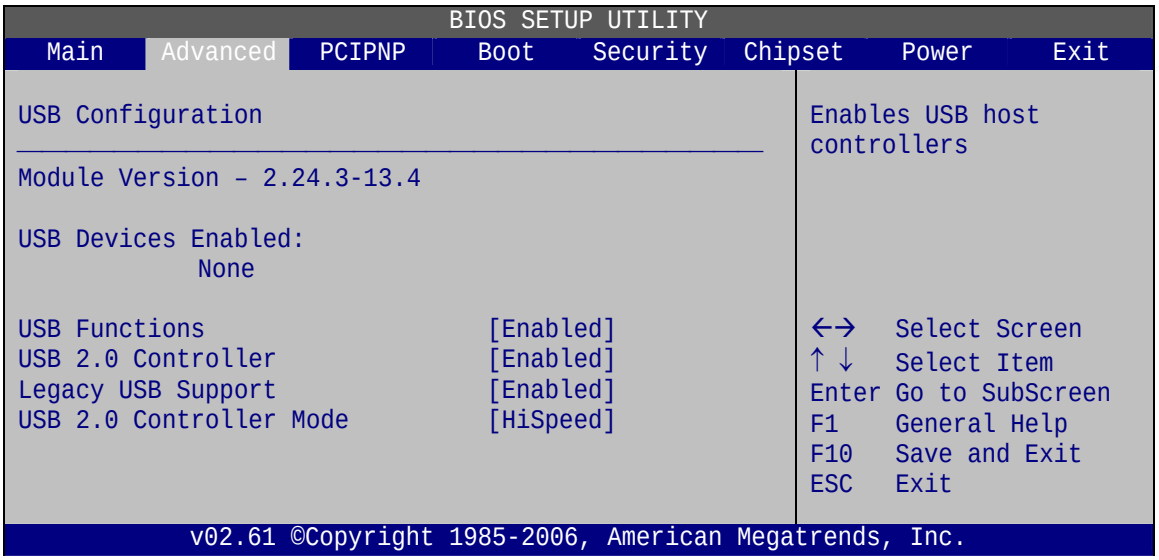
➔ **Terminal Type [ANSI]**

Use the **Terminal Type** BIOS option to specify the remote terminal type.

➔ **ANSI**	**DEFAULT**	The target terminal type is ANSI
➔ **VT100**		The target terminal type is VT100
➔ **VT-UTF8**		The target terminal type is VT-UTF8

5.3.6 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 9**) to read USB configuration information and configure the USB settings.



BIOS Menu 9: USB Configuration

➔ **USB Configuration**

The **USB Configuration** field shows the system USB configuration. The items listed are:

- Module Version: x.xxxxx.xxxxx

➔ **USB Devices Enabled**

The **USB Devices Enabled** field lists the USB devices that are enabled on the system

➔ **USB Function [Enabled]**

Use the **USB Function** BIOS option to enable or disable USB function support.

➔	**Disabled**		USB function support disabled
➔	**Enabled**	**DEFAULT**	USB function support enabled

➔ **USB 2.0 Controller [Enabled]**

Use the **USB 2.0 Controller** BIOS option is enabled.

➔ **Legacy USB Support [Enabled]**

Use the **Legacy USB Support** BIOS option to enable USB mouse and USB keyboard support.

Normally if this option is not enabled, any attached USB mouse or USB keyboard does not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB driver loaded onto the system.

➔ **Disabled**		Legacy USB support disabled
➔ **Enabled**	**DEFAULT**	Legacy USB support enabled
➔ **Auto**		Legacy USB support disabled if no USB devices are connected

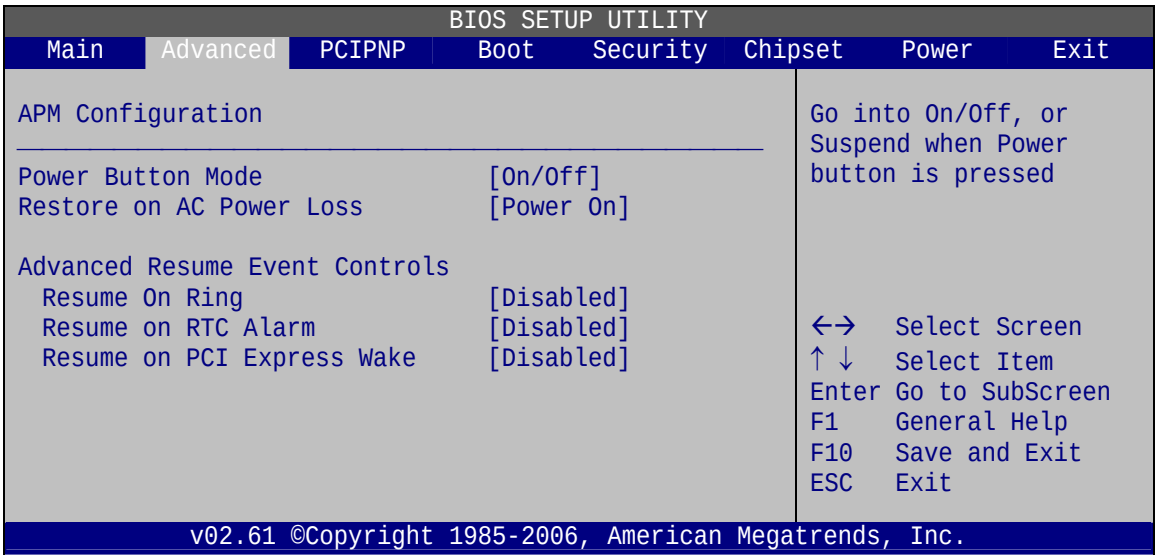
➔ **USB2.0 Controller Mode [HiSpeed]**

Use the **USB2.0 Controller Mode** option to set the speed of the USB2.0 controller.

➔ **FullSpeed**		The controller is capable of operating at 12 Mb/s
➔ **HiSpeed**	**DEFAULT**	The controller is capable of operating at 480 Mb/s

5.3.7 Power Configuration

The **Power Configuration** menu (**BIOS Menu 10**) allows the advanced power management options to be configured.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Power Exit
APM Configuration
Power Button Mode [On/Off]
Restore on AC Power Loss [Power On]
Advanced Resume Event Controls
Resume On Ring [Disabled]
Resume on RTC Alarm [Disabled]
Resume on PCI Express Wake [Disabled]
Go into On/Off, or Suspend when Power button is pressed
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 10: APM Configuration

➔ **Power Management/APM [Enabled]**

Use the **Power Management/APM** BIOS option to enable access to the advanced power management features. If this option is disabled, the only other option on the screen is the **Power Button Mode**.

➔ **Disabled** Disables the Advanced Power Management (APM) feature

➔ **Enabled** **DEFAULT** Enables the APM feature

➔ **Power Button Mode [On/Off]**

Use the **Power Button Mode** BIOS to specify how the power button functions.

➔ **On/Off** **DEFAULT** When the power button is pressed the system is either turned on or off

➔ **Suspend** When the power button is pressed the system goes into suspend mode

➔ **Resume on Ring [Disabled]**

Use the **Resume on Ring** BIOS option to enable activity on the RI (ring in) modem line to rouse the system from a suspend or standby state. That is, the system will be roused by an incoming call on a modem.

➔ **Disabled**	**DEFAULT**	Wake event not generated by an incoming call
➔ **Enabled**		Wake event generated by an incoming call

➔ **Resume On RTC Alarm [Disabled]**

Use the **Resume On RTC Alarm** option to specify the time the system should be roused from a suspended state.

➔ **Disabled**	**DEFAULT**	The real time clock (RTC) cannot generate a wake event
➔ **Enabled**		If selected, the following appears with values that can be selected: RTC Alarm Date (Days) System Time After setting the alarm, the computer turns itself on from a suspend state when the alarm goes off.

➔ **Resume on PCI-Express WAKE# [Enabled]**

The **Resume on PCI-Express WAKE#** BIOS option specifies if the system is roused from a suspended or standby state when there is activity on the PCI-Express bus.

➔ **Disabled**		Wake event not generated by PCI-Express activity
➔ **Enabled**	**DEFAULT**	Wake event generated by PCI-Express activity

5.4 PCI/PnP

Use the **PCI/PnP** menu (**BIOS Menu 11**) to configure advanced PCI and PnP settings.

WARNING!

Setting wrong values for the BIOS selections in the PCIPnP BIOS menu may cause the system to malfunction.

```
                        BIOS SETUP UTILITY
  Main    Advanced   PCIPNP    Boot    Security  Chipset   Power    Exit

Advanced PCI/PnP Settings                    | Available: Specified IRQ
-------------------------------------------- | is available to be use
WARNING: Setting wrong values in below sections | the PCI/PnP devices
         may cause system to malfunction     | Reserved: Specified IRQ
IRQ3                              [Reserved] | is reserved for use by
IRQ4                              [Reserved] | legacy ISA devices
IRQ5                              [Available]|
IRQ7                              [Available]|
IRQ9                              [Available]|
IRQ10                             [Available]|
IRQ11                             [Available]|
IRQ14                             [Available]|
IRQ15                             [Available]|
                                             |
DMA Channel 0                     [Available]| ←→   Select Screen
DMA Channel 1                     [Available]| ↑ ↓   Select Item
DMA Channel 3                     [Available]| Enter Go to SubScreen
DMA Channel 5                     [Available]| F1    General Help
DMA Channel 6                     [Available]| F10   Save and Exit
DMA Channel 7                     [Available]| ESC   Exit
                                             |
Reserved Memory Size              [Disabled] |

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```

BIOS Menu 11: PCI/PnP Configuration

➔ **IRQ# [Available]**

Use the **IRQ#** address to specify what IRQs can be assigned to a particular peripheral device.

➔ **Available** **DEFAULT** The specified IRQ is available to be used by PCI/PnP devices

➔ **Reserved** The specified IRQ is reserved for use by Legacy ISA devices

Available IRQ addresses are:

- IRQ3
- IRQ4
- IRQ5
- IRQ7
- IRQ9
- IRQ10
- IRQ 11
- IRQ 14
- IRQ 15

➔ **DMA Channel# [Available]**

Use the **DMA Channel#** option to assign a specific DMA channel to a particular PCI/PnP device.

➔ **Available** **DEFAULT** The specified DMA is available to be used by PCI/PnP devices

➔ **Reserved** The specified DMA is reserved for use by Legacy ISA devices

Available DMA Channels are:

- DM Channel 0
- DM Channel 1
- DM Channel 3
- DM Channel 5
- DM Channel 6
- DM Channel 7

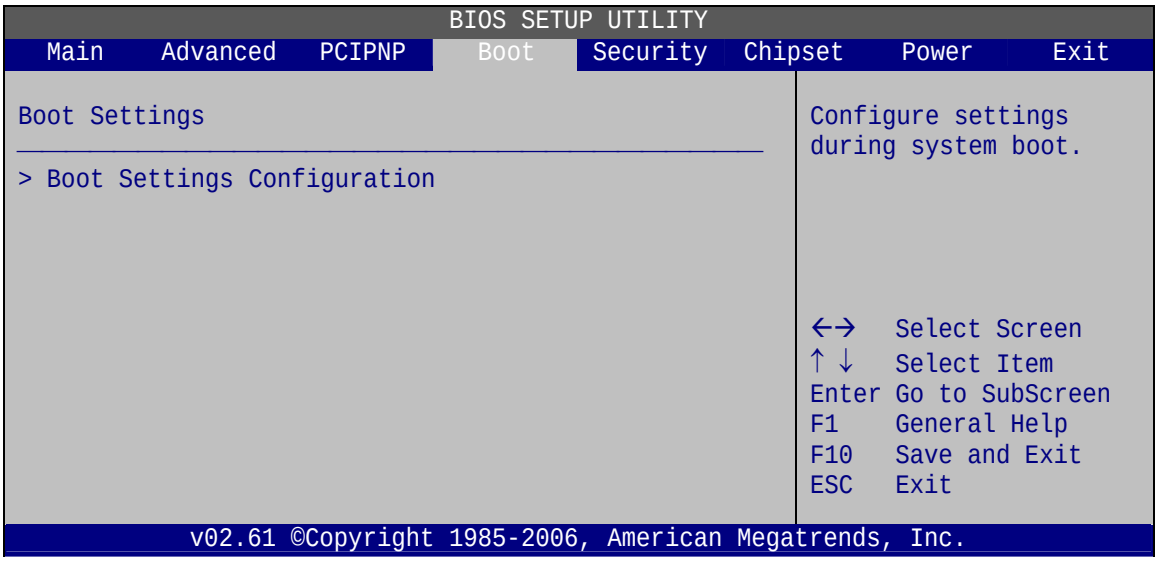
➔ **Reserved Memory Size [Disabled]**

Use the **Reserved Memory Size** BIOS option to specify the amount of memory that should be reserved for legacy ISA devices.

➔	**Disabled**	**DEFAULT**	No memory block reserved for legacy ISA devices
➔	**16K**		16 KB reserved for legacy ISA devices
➔	**32K**		32 KB reserved for legacy ISA devices
➔	**64K**		54 KB reserved for legacy ISA devices

5.5 Boot

Use the **Boot** menu (**BIOS Menu 12**) to configure system boot options.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Power Exit
Boot Settings
> Boot Settings Configuration
Configure settings during system boot.
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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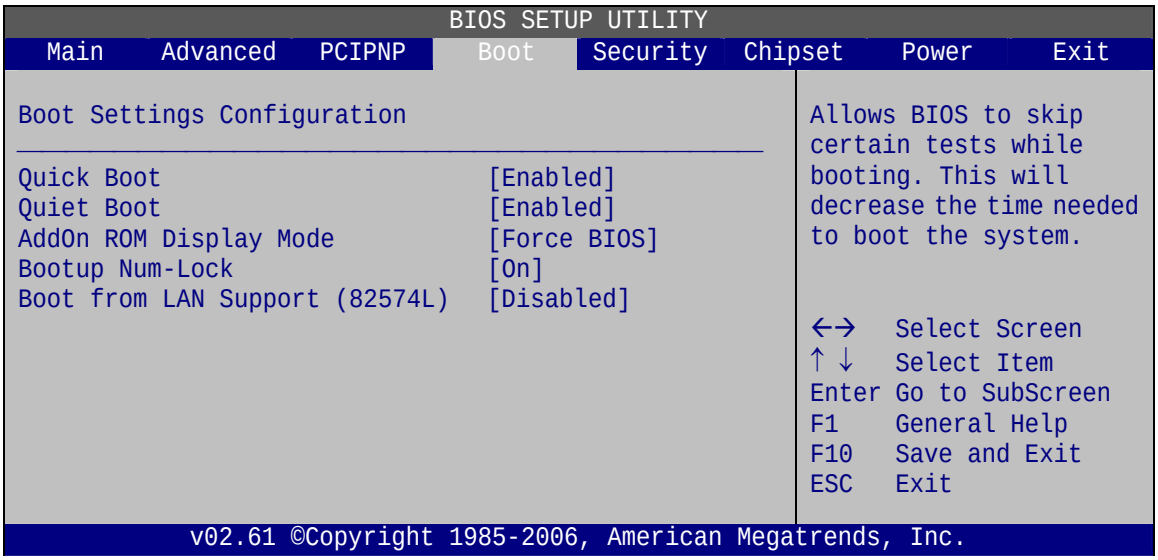
BIOS Menu 12: Boot

5.5.1 Boot Settings Configuration

Use the **Boot Settings Configuration** menu (**BIOS Menu 13**) to configure advanced system boot options.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Power Exit
Boot Settings Configuration
Quick Boot [Enabled]
Quiet Boot [Enabled]
AddOn ROM Display Mode [Force BIOS]
Bootup Num-Lock [On]
Boot from LAN Support (82574L) [Disabled]
Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 13: Boot Settings Configuration

➔ **Quick Boot [Enabled]**

Use the **Quick Boot** BIOS option to make the computer speed up the boot process.

➔ **Disabled**		No POST procedures are skipped
➔ **Enabled**	**DEFAULT**	Some POST procedures are skipped to decrease the system boot time

➔ **Quiet Boot [Enabled]**

Use the **Quiet Boot** BIOS option to select the screen display when the system boots.

➔ **Disabled**		Normal POST messages displayed
➔ **Enabled**	**DEFAULT**	OEM Logo displayed instead of POST messages

➔ **AddOn ROM Display Mode [Force BIOS]**

Use the **AddOn ROM Display Mode** option to allow add-on ROM (read-only memory) messages to be displayed.

➔ **Force BIOS**	**DEFAULT**	The system forces third party BIOS to display during system boot.

➔ **Keep Current** The system displays normal information during system boot.

➔ **Bootup Num-Lock [On]**

Use the **Bootup Num-Lock** BIOS option to specify if the number lock setting must be modified during boot up.

➔ **Off** Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.

➔ **On** **DEFAULT** Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.

➔ **Boot From LAN Support (82574L) [Disabled]**

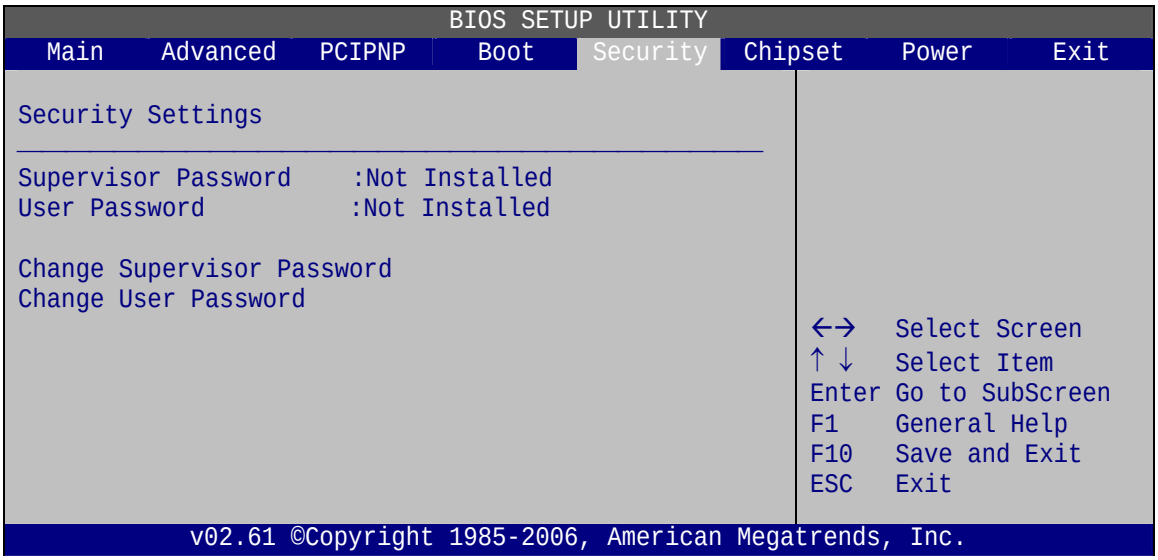
Use the **Boot From LAN Support** option to enable the Intel® PCIe GbE 82574L controller to boot the system.

➔ **Disabled** **DEFAULT** Cannot be booted from a remote system through the Intel® PCIe GbE 82574L controller

➔ **Enabled** Can be booted from a remote system through the Intel® PCIe GbE 82574L controller

5.6 Security

Use the **Security** menu (**BIOS Menu 14**) to set system and user passwords.



BIOS Menu 14: Security

➔ **Change Supervisor Password**

Use the **Change Supervisor Password** to set or change a supervisor password. The default for this option is **Not Installed**. If a supervisor password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change Supervisor Password**.

➔ **Change User Password**

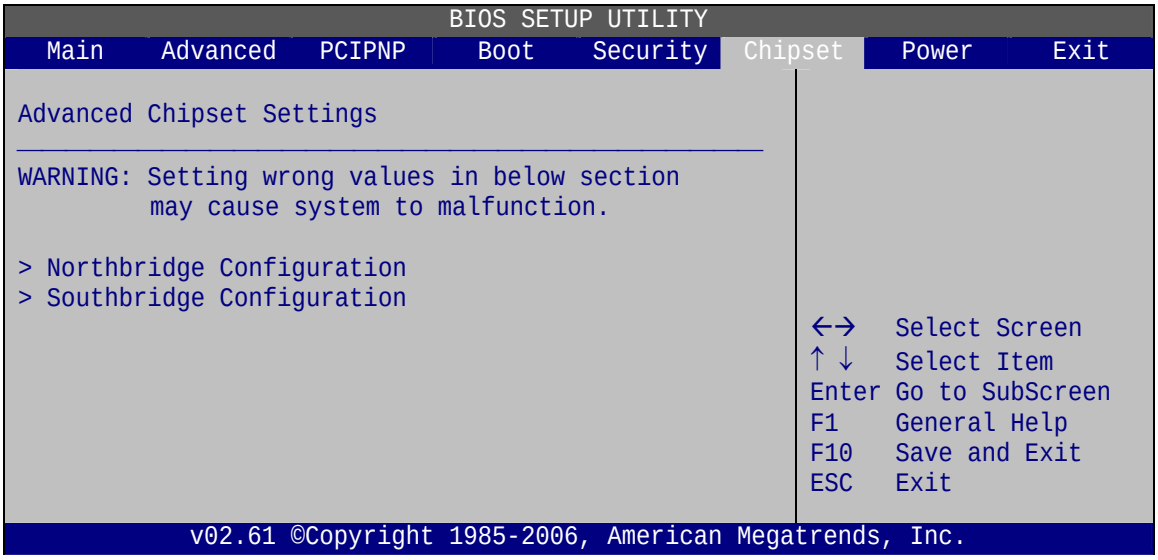
Use the **Change User Password** to set or change a user password. The default for this option is **Not Installed**. If a user password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change User Password**.

5.7 Chipset

Use the **Chipset** menu (**BIOS Menu 15**) to access the Northbridge and Southbridge configuration menus

WARNING!

Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Power Exit
Advanced Chipset Settings
WARNING: Setting wrong values in below section
may cause system to malfunction.
> Northbridge Configuration
> Southbridge Configuration
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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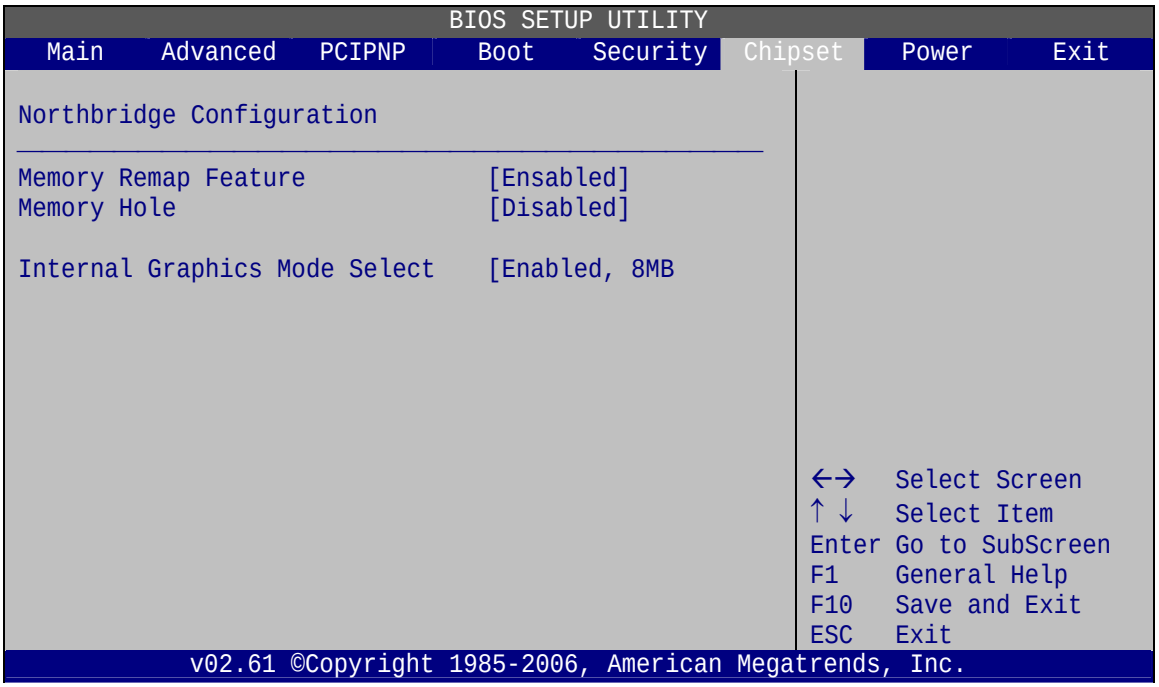
BIOS Menu 15: Chipset

5.7.1 Northbridge Configuration

Use the **Northbridge Chipset Configuration** menu (**BIOS Menu 16**) to configure the Northbridge chipset.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Power Exit
Northbridge Configuration
Memory Remap Feature [Ensabled]
Memory Hole [Disabled]
Internal Graphics Mode Select [Enabled, 8MB
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 16:Northbridge Chipset Configuration

➔ **Memory Remap Feature [Enabled]**

Use the **Memory Remap Feature** option to allow the overlapped PCI memory above the total physical memory to be remapped.

➔ **Enabled**	**DEFAULT**	Overlapped PCI memory can be remapped
➔ **Disabled**		Overlapped PCI memory cannot be remapped

➔ **Memory Hole [Disabled]**

Use the **Memory Hole** option to reserve memory space between 15 MB and 16 MB for ISA expansion cards that require a specified area of memory to work properly. If an older ISA expansion card is used, please refer to the documentation that came with the card to see if it is necessary to reserve the space.

➔ **Disabled**	**DEFAULT**	Memory is not reserved for ISA expansion cards
➔ **15 MB – 16 MB**		Between 15 MB and 16 MB of memory is reserved for ISA expansion cards

➔ **Boots Graphics Adapter [PEG/PCI]**

Use the **Boots Graphics Adapter** option to select the graphics controller used as the primary boot device. Select either an integrated graphics controller (IGD) or a combination of PCI graphics controller, a PCI express (PEG) controller or an IGD. Configuration options are listed below:

- IGD DEFAULT
- PCI/IGD
- PEG/IGD

➔ **Internal Graphics Mode Select [Enable, 8 MB]**

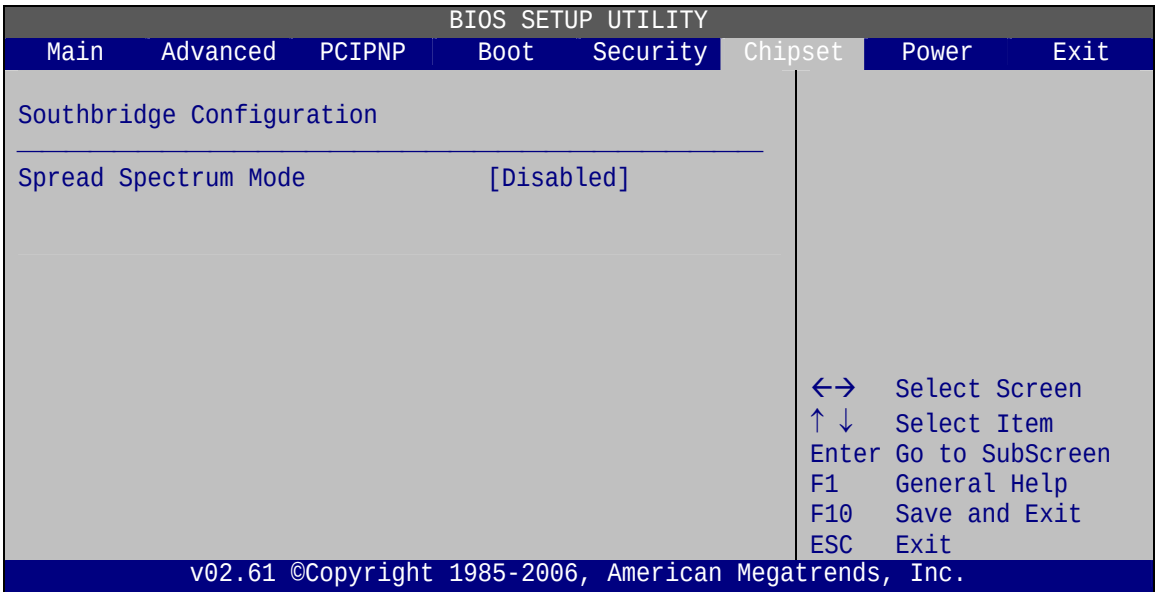
Use the **Internal Graphic Mode Select** option to specify the amount of system memory that can be used by the internal graphics device.

➔ **Disable**

➔ **Enable, 8 MB** **DEFAULT** 8 MB of memory used by internal graphics device

5.7.2 Southbridge Configuration

Use the **Southbridge Configuration** menu (**BIOS Menu 17**) to configure the Southbridge chipset.



BIOS Menu 17:Southbridge Chipset Configuration

➔ **Spread Spectrum [Disabled]**

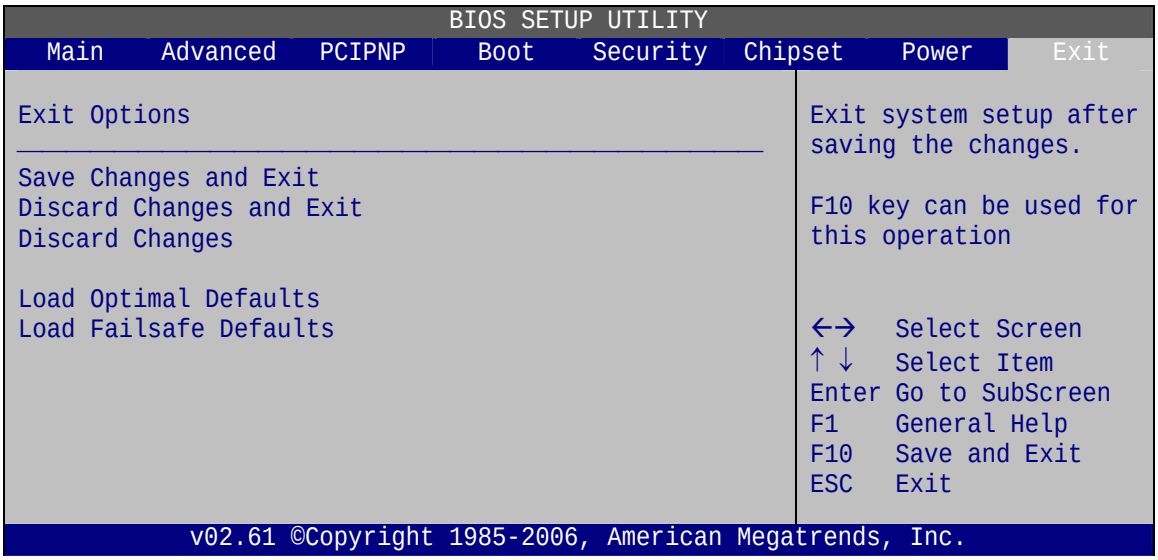
Use the **Spread Spectrum** option to reduce the EMI. Excess EMI is generated when the system clock generator pulses have extreme values. Spreading the pulse spectrum modulates changes in the extreme values from spikes to flat curves, thus reducing the EMI. This benefit may in some cases be outweighed by problems with timing-critical devices, such as a clock-sensitive SCSI device.

➔ **Disabled** **DEFAULT** EMI not reduced

➔ **Enabled** EMI reduced

5.8 Exit

Use the **Exit** menu (**BIOS Menu 18**) to load default BIOS values, optimal failsafe values and to save configuration changes.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Power Exit
Exit Options
Save Changes and Exit
Discard Changes and Exit
Discard Changes
Load Optimal Defaults
Load Failsafe Defaults
Exit system setup after saving the changes.
F10 key can be used for this operation
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 18:Exit

➔ **Save Changes and Exit**

Use the **Save Changes and Exit** option to save the changes made to the BIOS options and to exit the BIOS configuration setup program.

➔ **Discard Changes and Exit**

Use the **Discard Changes and Exit** option to exit the BIOS configuration setup program without saving the changes made to the system.

➔ **Discard Changes**

Use the **Discard Changes** option to discard the changes and remain in the BIOS configuration setup program.

➔ **Load Optimal Defaults**

Use the **Load Optimal Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F9 key can be used for this operation.**

➔ **Load Failsafe Defaults**

Use the **Load Failsafe Defaults** option to load failsafe default values for each of the parameters on the Setup menus. **F8 key can be used for this operation.**

Appendix

A

BIOS Options

Below is a list of BIOS configuration options in the BIOS chapter.

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Appendix

B

Terminology

ACPI	Advanced Configuration and Power Interface (ACPI) is an OS-directed configuration, power management, and thermal management interface.
AHCI	Advanced Host Controller Interface (AHCI) is a SATA Host controller register-level interface.
ATA	The Advanced Technology Attachment (ATA) interface connects storage devices including hard disks and CD-ROM drives to a computer.
ARMD	An ATAPI Removable Media Device (ARMD) is any ATAPI device that supports removable media, besides CD and DVD drives.
BIOS	The Basic Input/Output System (BIOS) is firmware that is first run when the computer is turned on and can be configured by the end user
CompactFlash®	CompactFlash® is a solid-state storage device. CompactFlash® devices use flash memory in a standard size enclosure. Type II is thicker than Type I, but a Type II slot can support both types.
CMOS	Complimentary metal-oxide-conductor is an integrated circuit used in chips like static RAM and microprocessors.
COM	COM refers to serial ports. Serial ports offer serial communication to expansion devices. The serial port on a personal computer is usually a male DB-9 connector.
DDR	Double Data Rate refers to a data bus transferring data on both the rising and falling edges of the clock signal.
DMA	Direct Memory Access (DMA) enables some peripheral devices to bypass the system processor and communicate directly with the system memory.
DIMM	Dual Inline Memory Modules are a type of RAM that offer a 64-bit data bus and have separate electrical contacts on each side of the module.
DIO	The digital inputs and digital outputs are general control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.
EIDE	Enhanced IDE (EIDE) is a newer IDE interface standard that has data transfer rates between 4.0 MBps and 16.6 MBps.

EIST	Enhanced Intel® SpeedStep Technology (EIST) allows users to modify the power consumption levels and processor performance through application software. The application software changes the bus-to-core frequency ratio and the processor core voltage.
FSB	The Front Side Bus (FSB) is the bi-directional communication channel between the processor and the Northbridge chipset.
GbE	Gigabit Ethernet (GbE) is an Ethernet version that transfers data at 1.0 Gbps and complies with the IEEE 802.3-2005 standard.
GPIO	General purpose input
HDD	Hard disk drive (HDD) is a type of magnetic, non-volatile computer storage device that stores digitally encoded data.
ICH	The Input/Ouput Control Hub (ICH) is an Intel® Southbridge chipset.
L1 Cache	The Level 1 Cache (L1 Cache) is a small memory cache built into the system processor.
L2 Cache	The Level 2 Cache (L2 Cache) is an external processor memory cache.
LCD	Liquid crystal display (LCD) is a flat, low-power display device that consists of two polarizing plates with a liquid crystal panel in between.
LVDS	Low-voltage differential signaling (LVDS) is a dual-wire, high-speed differential electrical signaling system commonly used to connect LCD displays to a computer.
POST	The Power-on Self Test (POST) is the pre-boot actions the system performs when the system is turned-on.
RAM	Random Access Memory (RAM) is volatile memory that loses data when power is lost. RAM has very fast data transfer rates compared to other storage like hard drives.
SATA	Serial ATA (SATA) is a serial communications bus designed for data transfers between storage devices and the computer chipsets. The SATA bus has transfer speeds up to 1.5 Gbps and the SATA 3Gb/s bus has data transfer speeds of up to 3.0 Gbps.
S.M.A.R.T	Self Monitoring Analysis and Reporting Technology (S.M.A.R.T) refers to automatic status checking technology implemented on hard disk drives.

USB	The Universal Serial Bus (USB) is an external bus standard for interfacing devices. USB 1.1 supports 12Mbps data transfer rates and USB 2.0 supports 480Mbps data transfer rates.
VGA	The Video Graphics Array (VGA) is a graphics display system developed by IBM.

Appendix

C

Watchdog Timer

NOTE:

The following discussion applies to DOS. Contact IEI support or visit the IEI website for drivers for other operating systems.

The Watchdog Timer is a hardware-based timer that attempts to restart the system when it stops working. The system may stop working because of external EMI or software bugs. The Watchdog Timer ensures that standalone systems like ATMs will automatically attempt to restart in the case of system problems.

A BIOS function call (INT 15H) is used to control the Watchdog Timer.

INT 15H:

AH – 6FH Sub-function:	
AL – 2:	Sets the Watchdog Timer's period.
BL:	Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup).

Table C-1: AH-6FH Sub-function

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. When the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

NOTE:

The Watchdog Timer is activated through software. The software application that activates the Watchdog Timer must also deactivate it when closed. If the Watchdog Timer is not deactivated, the system will automatically restart after the Timer has finished its countdown.

EXAMPLE PROGRAM:

```
; INITIAL TIMER PERIOD COUNTER
;
W_LOOP:
;
        MOV     AX, 6F02H       ;setting the time-out value
        MOV     BL, 30          ;time-out value is 48 seconds
        INT     15H
;
; ADD THE APPLICATION PROGRAM HERE
;
        CMP     EXIT_AP, 1      ;is the application over?
        JNE     W_LOOP          ;No, restart the application
        MOV     AX, 6F02H       ;disable Watchdog Timer
        MOV     BL, 0           ;
        INT     15H
;
; EXIT ;
```

Appendix

D

Compatibility

NOTE:

The compatible items described here have been tested by the IEI R&D team and found to be compatible with the ISP-9652/9602

D.1 Compatible Operating Systems

The following operating systems have been successfully run on the ISP-9652/9602.

- Microsoft Windows Vista (32-bit)
- Microsoft Windows Vista (64-bit)
- Microsoft Windows XP with SP2 (32-bit)
- Linux (Fedora 8/9)

D.2 Compatible Processors

The following Socket P processors have been successfully tested on the ISP-9652/9602.

CPU	Model Number	Clock Speed	FSB	Architecture
Intel® Core™2 Duo	P9500	2.53 GHz	1066 MHz	45 nm
Intel® Core™2 Duo	P8600	2.4 GHz	1066 MHz	45 nm
Intel® Core™2 Duo	P8400	2.26 GHz	1066 MHz	45 nm
Intel® Core™2 Duo	T9600	2.8 GHz	1066 MHz	45 nm
Intel® Core™2 Duo	T9500	2.6 GHz	800 MHz	45 nm
Intel® Core™2 Duo	T9400	2.53 GHz	1066 MHz	45 nm
Intel® Core™2 Duo	T8100	2.1 GHz	800 MHz	45 nm
Intel® Core™2 Duo	T7700	2.4 GHz	800 MHz	65 nm
Intel® Core™2 Duo	T7500	2.2 GHz	800 MHz	65 nm
Intel® Core™2 Duo	T7300	2.0 GHz	800 MHz	65 nm
Intel® Celeron® M	575	2.00 GHz	667 MHz	65 nm

D.3 Compatible Memory Modules

NOTE:

The memory modules listed below have been tested on the ISP-9652/9602 other memory modules that comply with the specifications may also work on the ISP-9652/9602 but have not been tested.

The following DDR2 memory modules have been successfully tested on the ISP-9652/9602.

Manufacturer	Chip Model No.	Capacity	Speed
Kingston	KVR800D2S6/1G	1.0 GB	800 MHz
Kingston	KVR667D2N5/2G	2.0 GB	667 MHz
Kingston	ELPIDA E1108BACBG-8E-E	2.0 GB	800 MHz
Apacer	AM4B580BCQJSBE	2.0 GB	800 MHz
Apacer	SAMSUNG K4T2G074QA	2.0 GB	667 MHz
Transcend	V59C1512804QBF25	1.0 GB	800 MHz
Transcend	TQ123PJF8	2.0 GB	800 MHz
Transcend	TQ243PCF8	1.0 GB	800 MHz
TwinMOS	8D23KN-TT	1.0 GB	667 MHz
UMAX	DA6701GP5-63BHt	1.0 GB	667 MHz
A-DATA	M20AD5G3H344611C52	512 MB	667 MHz
A-DATA	AD29608A8A-3EG	1.0 GB	667 MHz
A-DATA	M2OAD6G314430Q1E52	1.0 GB	800 MHz
CORSAIR	VS1GB667D2	1.0 GB	667 MHz
CORSAIR	VS51MB667D2	512 MB	667 MHz
KINGMAX	KKB8FFBXF-CFA-25A	1.0 GB	800 MHz
Infinity	64M8PC6400-0274W	1.0 GB	800 MHz
AVEXIR	AE1N6S8CBG-8E	2.0 GB	800 MHz

Appendix

E

Hazardous Materials Disclosure

E.1 Hazardous Materials Disclosure Table for IPB Products Certified as RoHS Compliant Under 2002/95/EC Without Mercury

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the table on the next page.

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	X	O	O	O	O	X
Display	X	O	O	O	O	X
Printed Circuit Board	X	O	O	O	O	X
Metal Fasteners	X	O	O	O	O	O
Cable Assembly	X	O	O	O	O	X
Fan Assembly	X	O	O	O	O	X
Power Supply Assemblies	X	O	O	O	O	X
Battery	O	O	O	O	O	O

O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006

X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有"环境友好使用期限"的标签，此期限是估算这些物质"不会有泄漏或突变"的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
壳体	X	O	O	O	O	X
显示	X	O	O	O	O	X
印刷电路板	X	O	O	O	O	X
金属螺帽	X	O	O	O	O	O
电缆组装	X	O	O	O	O	X
风扇组装	X	O	O	O	O	X
电力供应组装	X	O	O	O	O	X
电池	O	O	O	O	O	O

O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。

X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。